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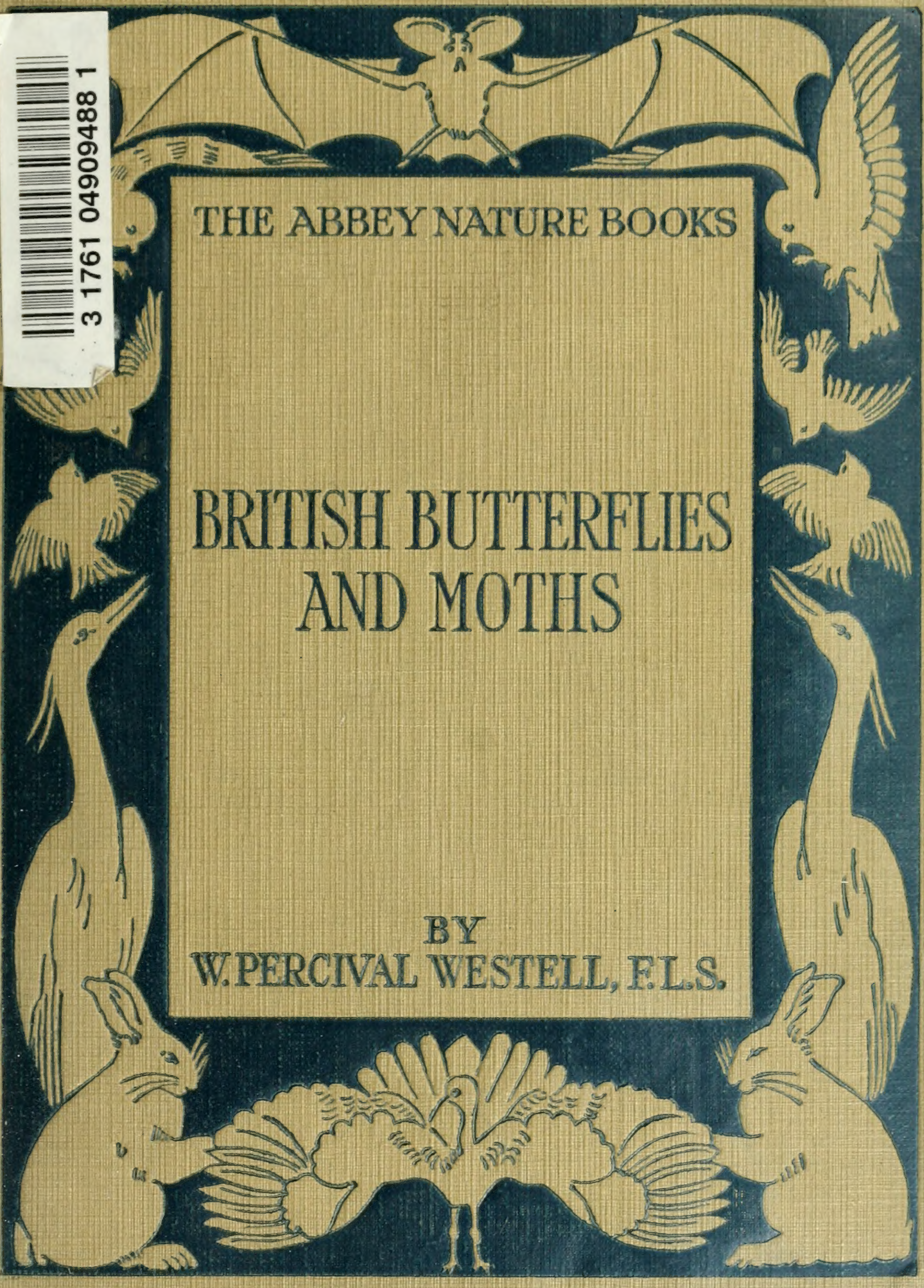

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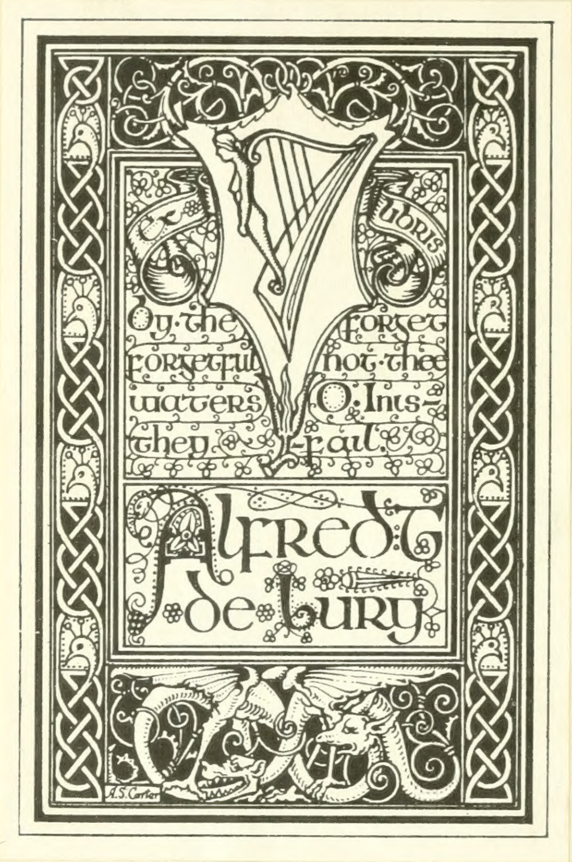
BRITISH BUTTERFLIES AND MOTHS

BY
W. PERCIVAL WESTELL, F.L.S.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BRITISH BUTTERFLIES AND MOTHS

THE ABBEY NATURE BOOKS

Coloured Plates and many Black and White Illustrations.

BRITISH MAMMALS.
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BRITISH REPTILES, AMPHIBIANS, AND FRESH-WATER FISHES.
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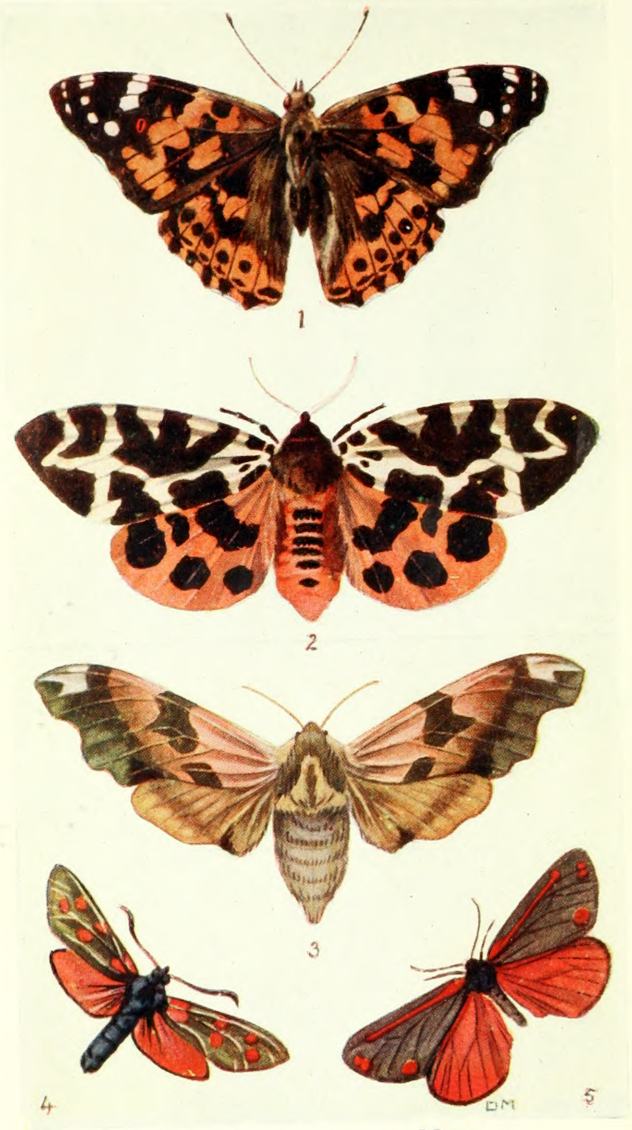
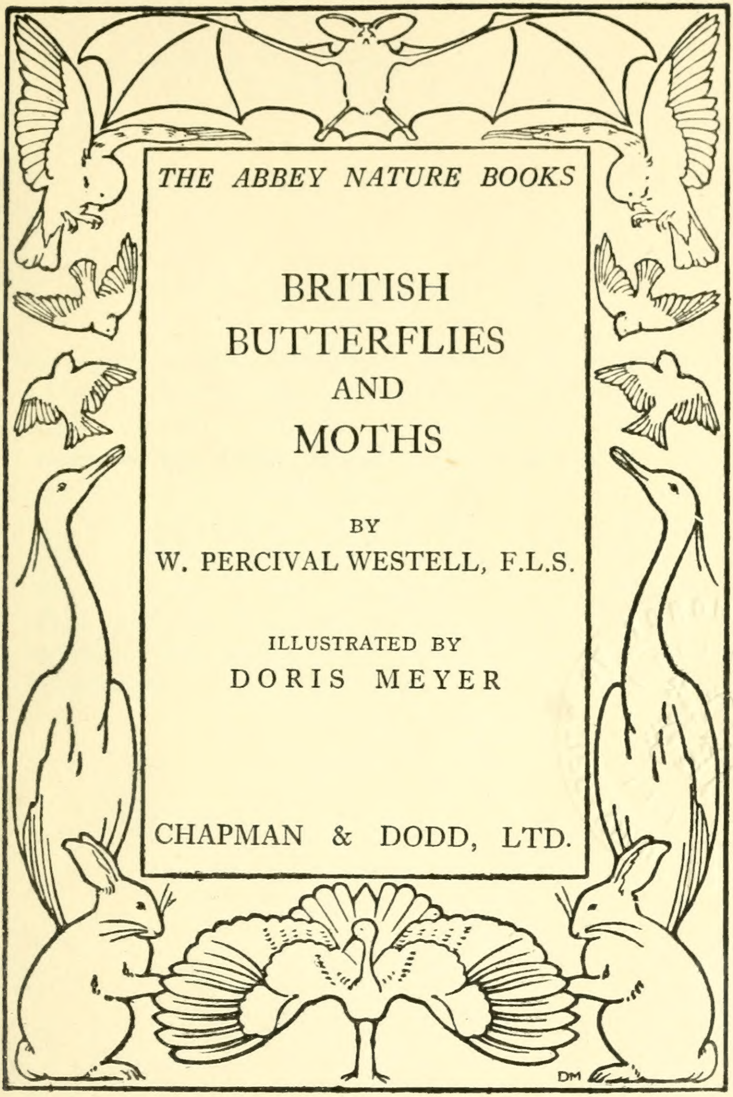


British Butterflies and Moths

1. Painted Lady Butterfly. 2. Garden Tiger Moth.
3. Lime Hawk-Moth. 4. Six-Spot Burnet Moth.
5. Cinnabar Moth.



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ILLUSTRATED BY
DORIS MEYER

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INTRODUCTORY NOTE

It is only possible in a small volume such as this to include a selection from the large array of Butterflies and Moths tenanting our own native land, and whereas the former are fairly well represented here, there are gaps among the Moths which only a more elaborate text-book can supply. Such a series as Mr. Richard South's reliable and useful volumes: "The Moths of the British Isles," may be heartily recommended, to which, and the companion volume on Butterflies, the author of this present book freely acknowledges his indebtedness

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BRITISH BUTTERFLIES AND MOTHS

Introduction.—Butterflies and Moths, even in our own temperate and oftimes sunless climate, are among the most gorgeous, and certainly among the most wonderful, of Nature's productions. Of airy flight, alluring or modest colouring and marking, and passing through a life-cycle—egg, larva, pupa, and imago—of unsurpassed interest, there is small wonder that these insect-folk make such a strong appeal to our sense of beauty and imagination. I suggest that every girl and boy, and grown-ups, too, for that matter, who are desirous of becoming on intimate terms of acquaintance with either butterflies or moths, would be well advised to rear some of either, or both, so as to observe at first hand the changes they undergo, and the interesting habits they possess. In some species the transformation from egg to larva (or caterpillar), larva to pupa (or chrysalis), and from pupa to imago (or perfect insect), is performed in double-quick time. In others the progress is slow, for the larva may become quiescent during Winter, and commence feeding in the Spring, or the pupa remains unhatched for so long a time that one may well despair of the arrival of the magic day of emergence. The great essentials seem to be for the hungry larvæ to have a good supply of their natural food-plants, and the acquisition by the observer of some knowledge concerning the life and habits of the particular species under observation. Better to make a beginning with a few commoner examples than experiment with rarer forms, for some of these insect-folk have an unaccountable habit of refusing food, and failure to rear specimens successfully must, at times, be expected. One word of warning is necessary. If it is desired to make a collection of set specimens for the cabinet, it is hoped that only male and female (and perhaps a few varieties) of each species will be retained. Further specimens than one of each sex take up needless space, and if the insect happens to be useful in the economy of Nature, or is incapable of perpetrating any harm as a pest, it is undue destruction to possess more specimens than necessary. More may be reared than are required without harm accruing, but on attaining the adult state they should be given their liberty so as to help perpetuate their race. Two instances for and against this collecting mania may be given. In one a boy-friend reared fifty Peacock Butterflies, and as these emerged and were then given their liberty, the pretty sight of so many of these gorgeous insects flitting about at the same time and place was as fair a scene as I have ever witnessed. Needless to add, the joy experienced by the boy who reared them knew no bounds. On the other hand, I knew a collector (who was certainly old enough to know better), who reared, killed, and set hundreds of Peacocks and Small Tortoiseshells (neither of which do any harm as the larvæ mostly feed upon stinging nettles), which showed little or no variety, and served no scientific, or other, purpose.

Butterflies and moths both undergo the same transformations from egg to perfect insect, and although there are wingless females among the latter, the butterflies, and the great majority of the moths, all possess wings. All the first-named, too, are day-fliers, and most of them are sun-lovers. The Ringlet Butterfly, as a reverse example, seems to prefer to fly in dull weather, when others of its fellows would not care to venture out, and there are certain kinds of moths which, unlike the rank and file of their kindred, are found abroad during the day. Moths, however, are mostly creatures of the night, and this may be ascertained when a door or window is left open in a lighted room of a Summer's evening, or if a visit is paid under cover of darkness to one of the great insect-banquets of the year. The attractions at these banquets consist, in the order given, of the globular heads of the sallow, or palm, in Spring; the sweet-scented trumpets of honeysuckle and satin-like blossoms of the bramble in Summer, and the honeyed flowers of the evergreen ivy in Autumn. The different species of these insects met with in a particular region varies according to the soil and situation in which discovered, and the type of plant-life that obtains. Thus, as well search for some kinds of butterflies away from the chalk as for a needle in a bundle of hay. On the other hand, one would be unlikely to meet with any success in searching for the scarce Swallow-tail Butterfly on the slopes of the chalky Chilterns as this handsome species is only found in England where a certain kind of wild parsley flourishes in damp situations. Then again, some species are gregarious and many will be found flying close together, or their larvæ discovered in some numbers; others are solitary when in the larval and adult states, the female depositing her eggs singly and not in groups or clusters.

Of the manner in which these insects harmonise with their surroundings when at rest, the reader will doubtless have had personal experience. The male Orange-tip Butterfly, for instance, is fairly conspicuous when in flight, but as it is seen resting with the wings closed, it is a difficult task to distinguish it, and the same may be said of the closed forms of the Peacock and Tortoiseshell Butterflies. Warning colour-eyes above, almost complete protection below because of the sombre markings, such may describe the handsome Peacock. With notable exceptions, our British Moths are much less gaudy than their cousins, the Butterflies, and this being so their harmonisation with their environment is constantly remarked upon. The same remark applies to many larvæ, and as regards the eggs (beautiful objects though they are) only the eye of an expert (or a bird!) is likely to discover them. The pupæ, when not hidden below ground away from one's gaze, are also cleverly camouflaged so as to escape detection from enemies.

The whole subject is an entrancing one, especially when the diligent observer endeavours to build up the nature-study of the subject, so as to ascertain some idea of the place the particular creature occupies in the environment which it visits, or inhabits. This, after all, brings the greatest joy, and only those who have, through constant intercession with Nature, become converted to this belief possess any adequate conception of the basic principles of life, and realise how, as has been written in a previous volume in this series, all things that live are closely, or distantly, related to one another. It is a good idea, too, to pursue *regional* studies rather than engage in a mad scamper here, there, and everywhere. The results obtained are far more satisfactory, and observation of local fauna and flora helps one to assist in the compilation of a national system. It must not be supposed that I advocate attention being restricted to the locality in which one lives, as comparisons and deductions made elsewhere are likely to prove of inestimable value, but those who have opportunities for studying wild nature systematically all through the year, are far more likely to secure an accurate conception of the mineral, animal, and vegetable constitution by concentration upon a given area which is, as it were, under constant survey. Butterflies and Moths belong to the Class *Insecta* (Insects), and the Order *Lepidoptera* which latter, being interpreted, means scale-winged, from two Greek words *Lepis*=a scale, *pteron*=a wing. When handled, it will be observed that one's fingers become coated with a powdery substance which, placed under a microscope, shows itself as consisting of perfectly-formed scales. These vary in number and shape to an immense extent, even if restricted to British species only, and they present endless material for study and research.

Having decided that an insect belongs to this Order, the next step in classification is to ascertain the Family to which it rightly claims kinship. The Genus has then to be considered, and finally the Species. Many species, especially among the *Lepidoptera*, exhibit distinct varieties, and as such they are known. Soon after emergence from the pupal state, Butterflies and Moths acquire their perfect condition, and from then onwards there is no further growth, in fact a number of species do not take any food in the mature state, merely pairing, laying eggs, and then passing away. All growth is completed during the larval condition, and although the third transformation, *i.e.* the pupal state, is all-important, it is quiescent as regards butterflies and moths.

It is not within our province to give detailed information respecting anatomy, but it may be mentioned in connection with these insects that the horns, feelers, or antennæ, as they are variously called, have, with few exceptions, club-shaped extremities in butterflies, and pectinated antennæ in moths. The use of these feelers is now believed to be that of smell.

Attention should also be drawn to the protective hairs with which certain larvæ are lavishly provided. These act as a deterrent with regard to many kinds of birds, the Cuckoo being one of the few which relishes hairy larvæ, such as those of the Drinker and Tiger Moths. Care should be exercised after handling these hairy larvæ as they are liable to cause blistering, especially of the mouth. As the larva increases in size, it has the habit of changing its skin on several occasions before it is "full-fed," and ready to pupate.

Lastly, the wonderful forms of, and colour-ornamentation upon, some kinds of pupæ are very beautiful, and the silken girdle, or other method of suspension and attachment, is not the least feature of interest.

We may now proceed to give succinct accounts of a representative selection of our British Butterflies, classifying same under each Family to which they belong. There are not more than 68 species in all. Several of these are extinct, very rare, or restricted to special localities, and I propose to deal only with those likely to be encountered under normal circumstances

BRITISH BUTTERFLIES

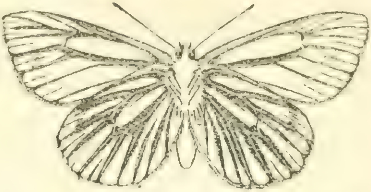
FAMILY PAPILIONIDÆ

Swallow-Tail. — (*Papilio machaon.*) This handsome species is now restricted to the two counties of Cambridge and Norfolk, where it haunts marshy situations, though it resorts abroad to woods and mountainous regions. It is on the wing from May onwards, the globular eggs being laid, for preference, upon milk parsley. Other food plants are angelica, fennel, and wild carrot. The larva is greenish-yellow, banded with black and orange, and after the third casting of the skin, a curious forked appendage appears upon the head. This can be raised or put away at will. The pupæ are to be discovered on the stems of plants. The imago is bright yellow, with ornate bands and veins of brownish-black. The hind wings have, as a rule, blue and red patches, and they terminate in a " tail," hence the popular name. The female is the larger of the two sexes.

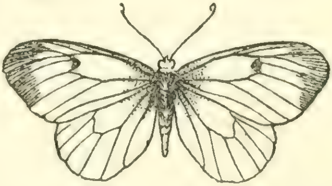
Large White.—(*Pieris brassicæ.*) This familiar species is commonly distributed, although in some years it is much more noticeable than others, due to the fact that it is a migratory insect. It haunts gardens, highways, lanes, and other places, and first appears on the wing in the late days of Spring. The eggs are laid in clusters, as the grower of cabbages knows to his cost, a favourite food-plant being the vegetable mentioned. The green larva is tinged with blue or grey on the upper parts, but is more self-coloured below. It emits a by no means pleasant odour. The grey and peppered pupa has a profuse array of black spots and yellow streaks, and as a rule, is well hidden. The imago is so well known that detailed description is almost superfluous, but it may be pointed out that, whilst both sexes have black-tipped margins on the upper edges of the fore wings, the female is distinguished by having two black spots and a line of the same in addition. The under-surface is much more brimstone-coloured, and both sexes have a black spot on the front margin of the hindwings.

Small White.—(*Pieris rapæ.*) Even more commonly distributed than its larger cousin, the Small White Butterfly is known by sight to almost every one in town and country. Its haunts are similar to those of *Pieris brassicæ*, but it is particularly fond of roadways, especially in a dry Summer after a water-cart has passed along. In the memorable drought of 1921 I counted over 50 of these insects drinking together at one spot, one of the prettiest sights I have ever witnessed in the realm of butterfly-life. As a rule, this species first occurs upon the wing during mid-April, but in 1921 a very early specimen was captured on the wing at Letchworth on February 16th which is a record date worth noting. The pale greenish egg merges into yellow, and then back to the former just previous to incubation. The larva lives upon similar food-plants to the species last dealt with, but is perhaps a little less restricted to feeding upon plants of the cabbage tribe. Fortunately, it is preyed upon by ichneumon flies, which help to reduce its numbers and act as natural balance-keepers. In some seasons it becomes a serious pest, and handpicking over cabbages is recommended. The pupa exhibits considerable variety of colour, and a favourite resort in which it may be found attached is an outhouse or fence. This species may be described as a small edition of *Pieris brassicæ*, excepting that the Spring specimens have the black markings less pronounced, or absent. In the Summer brood, however, the black tips to the forewings, and the one spot in the male and three in the female, are much more noticeable.

Green-Veined White.—(*Pieris napi.*) This pretty insect (Fig. 1) is of common occurrence, and shows a preference for grassy tracks bordering hedgerows. It possesses a strong swinging flight, and as one after another of the airy creatures come sailing along, a very attractive sight is witnessed. It is, like its two relatives already described, double-brooded, and late April or early May sees the first specimens upon the wing. The pale coloured, skittle-shaped egg is deposited singly on cruciferous plants, and the green larva has a dark line down the back, and a yellow one along the sides. The back and upper sides have black warts covered with hairs. The under parts are whitish-grey. The green pupa is relieved with brown and yellowish, but it exhibits variation in both colour and markings. The characteristic feature of the mature insect is the strongly-veined wings, especially the under-surfaces of the hind ones. It is sometimes difficult to determine which species it is (Small White or Green-Veined) as the insect flies quickly by, but all doubt is set at rest when the latter is discovered in a state of repose and close scrutiny is thus permitted.



Green-veined White. Fig 1
under side.

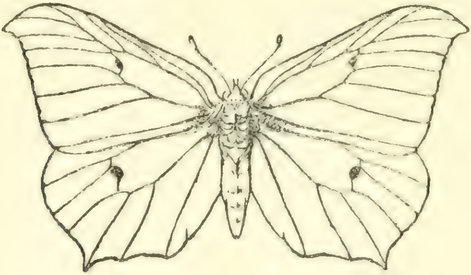


Orange Tip (female) Fig 2

Orange-Tip.—(*Euchloë cardamines.*) This favourite Butterfly (Fig. 2) rarely fails to attract attention when the male, with his orange-tipped forewings, flits by, It is a bold, strong flier, and wherever garlic and hedge mustard, cuckoo flower (cardamine), and other cruciferous plants are found, one may expect to come across it, these being the more usual food-plants. I almost always enter the first Orange-Tip in my Nature Diary by the end of the first week of May, and it is a great joy to see this little herald of the Summer again on the wing. Search may be made for the prominently fluted eggs in June, but it must be a careful one, or they will assuredly be overlooked. The larva eventually becomes bluish-green, and is adorned with blackish and whitish hairs proceeding from warts and dots respectively. A white line runs along the sides. The protective resemblance is very marked, and although the tapering pupa remains in position for several months, it is curious to notice how often it is overlooked. It is green at first, but becomes lighter colour later. The female imago has black tips at the edges of the forewings instead of orange, but the greenish-yellow mottling on the under surface of the hindwings is equally beautiful in both sexes. In dull weather one may frequently come across one of these insects resting on a wayside flower, or in the garden waiting for the advent of the sun.

Brimstone. — (*Gonepteryx rhamni.*) Passing by the Wood White and the Clouded Yellow, both of which are, as a rule, scarce insects, brings us to the Brimstone Butterfly (Fig. 3) which, in the region of the Chalky Chilterns where the author resides, is very plentiful. The reason for this is that the favourite food-plant of this species is the buckthorn, which delights to dwell in a calcareous soil. This is the last member of the Family

Papilionidæ with which we are concerned, and among our lepidopterous friends it is, with the possible exception of the Small Tortoiseshell, the first to appear in the Spring. I frequently record it on the wing in February, and perhaps it is the greatest moment in the year's biology when this regal creature is seen emerging from its hiding place ready for a new lease of life. One would expect the insect to be tattered and torn after braving the storms and frosts of Winter, but this is not so, and one hardly realises that it is not a freshly-emerged specimen. It is amazing to watch a female Brimstone searching for her favourite buckthorn bush, and to notice how ingeniously she passes by various other kinds of woody plants of which a hedgerow is made up. If the buckthorn is growing as an isolated bush, the insect will career hurriedly towards it, and it is a fascinating occupation to watch her depositing eggs. The buds of the host-plant are only just showing when the early Brimstones are on



Brimstone

Fig 3.

the wing, but they soon develop in readiness for the young larva to partake of its first meal. The egg, larva, and pupa must be sought for on the underside of a leaf, and the three colour changes of the former are pale green, yellowish, and purplish-grey. The larva is green, profusely specked with polished black. The bluish-green pupa is worthy of examination, not only because of its curious shape, but also by reason of its similarity to a contorted leaf. The male is the lighter-coloured of the two sexes, but both have a small orange spot on each of the four wings. The pointed tips to both pairs of wings, and the rounded formation, are salient features, and when at rest, with the organs of flight tightly closed, there is small wonder that, on seeing one thus for the first time, a friend remarked that it resembled " a beech leaf dipped in sunlight."

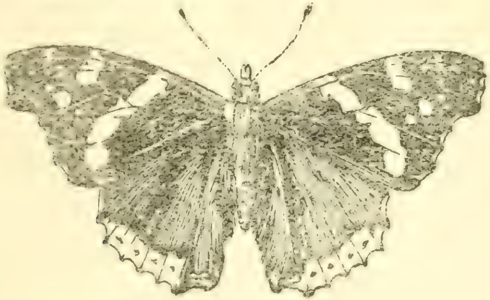
FAMILY NYMPHALIDÆ

Small Tortoiseshell. — (*Vanessa urticæ.*) The handsome Purple Emperor, White Admiral, Comma (so-called because of a curious mark on the under side of the hindwings), and rare Large Tortoiseshell come next in scientific sequence, but they must give way to the much more familiar species *V. urticæ.* This latter belongs, as will be seen, to a different family from the insects already treated of, and together with the Brimstone, Whites, and Peacock, is the best known of all. It is one of our commonest species, is not particular as to its haunt so long as there is a supply of stinging nettles (the favourite food-plant), and hibernated specimens are often on the wing during the first two months of the year. It is double-brooded, and the eggs are deposited on nettles in May and July. Colonies of larvæ may be discovered soon afterwards, and it is interesting to watch these develop. Every year I find the larvæ of this insect in the same nettle-bed, which seems to indicate that broods hatched in a certain spot carry on the habit of their ancestors season after season. If this is so, it opens up a most interesting trait in insect-life about which more careful research would probably reveal a great deal of information. Green in the first instance, the egg at a later stage, becomes yellow, and it is a beautiful object under a microscope, a remark which applies to the eggs of all these wonderful creatures. The larvæ *look* black all over, but closer examination will display other colouration and marking. The branched hairs are a feature worth noticing. As the old skins are shed, quite a collection of empty and full bodies are to be found congregated among nettles, but when the time has arrived for pupation, a mystery-play is enacted as, search how one will, it is well-nigh impossible to discover the well-hidden pupa. There is often a beautiful metallic lustre upon the inner side of the pupa, and if this is examined under a glass one has apt evidence of the hidden beauties of Nature. Seen for the first time by the inexperienced in such objects, it is bound to excite admiration, and a fund of interest and wonder is created. The general "tortoiseshell" appearance of the adult, with the frecklings of light blue on the outer margins and the kaleidoscopic change when the wings are closed, are well known. It is from the Autumn brood that the early rovers of Spring appear, and as the winged jewel spreads open its gay-coloured appendages upon the ground, and exercises them up and down, the observer is likely to be entranced at the wondrous sight taking place within a pace of where he stands.

Peacock.—(*Vanessa io.*) This gorgeous butterfly is a first-cousin of the Tortoiseshell, and it resembles it in selecting the same food-plant (stinging nettle), and the gregarious larvæ are somewhat similar, although decidedly blacker. Fortunately, it is a common inhabitant of our country, but it appears to have disappeared from some of its northern strongholds. It haunts wayside flowers and gardens, and is fond of alighting in a road, or pathway, and spreading open its wings like its last-mentioned relative. Early in Autumn the handsome Peacocks appear in full force, those observed earlier in the year being hibernated specimens which reached maturity the previous August, or September. The fluted and ribbed egg is similar in shape to that of the Small Tortoiseshell, and is of olive-green colour. The polished black larva is plentifully supplied with feathery hairs, and the segments of the body are clearly defined. The pupa varies in colour, and although many full-grown larvæ may be under observation in a nettle-bed, it is with difficulty one finds the pupæ as they are so cleverly hidden. The warm fulvous colour of the imago is richly decorated on all four wings with prominent eyespots, likened to the display feathers (not the tail) of the Peacock Bird. When the wings are extended, and then suddenly closed, the effect is quite startling, the change from high colouration to sombre hue being so pronounced. The outer margins of the wings have deckled edges. Another handsome member of the *Vanessas* is the Camberwell Beauty, but it is a red-letter day when a specimen is encountered, and we must now proceed to describe the next species upon our list in the person of the Painted Lady.

Painted Lady.—(*Pyrameis cardui.*) Belonging to another genus, this migratory species (see Frontispiece), is one of the gayest of our butterflies, and in a good year provides the country lover with a continuous feast of delight. I have watched as many as fifty at a time careering over the pyramids of sainfoin blossom within a stone's throw of my Garden City home, and counted it a privilege to live in such an arcadian wilderness. Strictly speaking, the Painted Lady is a native of a warmer and sunnier clime, but it flourishes in its own home to such an extent that it must needs seek "fields and pastures new." To our own little treasure island it comes all the way from Northern Africa, and wherever it goes its chief anxiety is to perpetuate its race. And there is no restricted period as to this, so long as conditions are suitable for it to carry on. It flashes past one on a Summer's day like a living jewel, its freckled wings glowing in the noonday sun, and infusing the gay cavalier (if Painted Ladies can thus be called), with light and life.

On, on she goes, now here, now there, fit subject for an artist's brush, and the nature lover's constant admiration. The green egg is laid on a thistle leaf. As it develops it darkens considerably, and in due course the hairy larva appears. It is of solitary disposition, so much so indeed that it constructs a silky apartment in which to reside. As, however, the larva often eats away its "environment," it would appear to defeat the object it had in view. The pupa, as well as the larva, varies in colour, and the former is richly shot with metallic lustre on various parts of the shroud. The perfect insect is freckled and spotted with black, brown, and white markings on a tawny-orange ground, and there is not a great deal of difference between the sexes. The underside of the wing is much lighter all over, and the spots on the hind wings are repeated at the rear, having dark centres ringed with white.



Red Admiral.

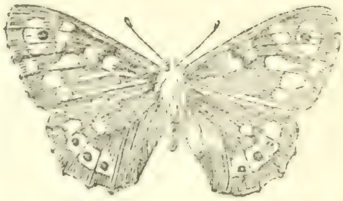
Fig 4.

Red Admiral.—(*Pyrameis atalanta.*) This lover of garden flowers and ripe fruit (Fig. 4) revels in the Autumn sunshine, and is so vividly contrasted in its rich bands of scarlet and white patches on a black and brown background, that small wonder exists as to its being a general favourite. I like it best of all because it comes to hearten us at the fall of the year, and because also it is so intent upon its nectar-sipping that it allows a close approach, I grow a variety of sedum specially to attract this gaily-coloured courtier of the flowers, and have often stroked a specimen that has been so occupied with its sweet pillage as to take no notice of the caresser. In the Autumn of 1922 the pink heads of the sedum failed to attract the Red Admirals in my garden so much as the phenomenal crop of victoria plums, and it was great fun to see the competition involved by the attentions of these handsome insects, as well as wasps, green bottle flies, and several other insect-revellers attracted to the feast. So daring (or inebriated) did one of the Admirals become, that it suddenly took to wing and alighted upon my outstretched hand! Belonging to the same genus as the Painted Lady, the species now under review is very plentiful in a favourable season, and I have seen whole companies of both these butterflies in Cornish and Devonshire lanes which refused to take flight as I approached. The source of attraction was the ragged pink heads of that tall sentinel of those fern-clad lanes, hemp agrimony. The Red Admiral has a somewhat similar range to its last-mentioned cousin, and although odd specimens may be seen earlier on, August is the true season to observe the Red Admiral at its height. The stinging nettle is the favourite food plant, and the solitary green egg is deposited upon the shoots and leaves. This soon changes colour as incubation advances.

The larva appears to vary a great deal, blackish, brownish, greyish, and other colours being produced. In any case, there is an array of branched hairs, and the larva builds a silken tent in which it can take cover, thus resembling the Painted Lady in this respect. The greyish pupa is relieved with a gold sheen of unsurpassed splendour, and when the hidden object is discovered under shelter of nettle leaves, the wayfarer may well reflect upon the truthfulness of Mrs. Browning's well-known lines that "Earth's crammed with heaven." That it is a migrant to this country seems agreed, but a great many items in its romantic career are missing, and the reader would perform useful service if an attempt was made to elucidate some of the mysteries of its life.

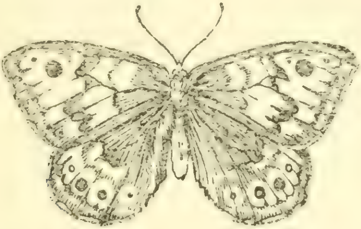
The Fritillaries—beautiful butterflies though they are—are of more or less local distribution, and cannot be dealt with at any length in a book of such modest dimensions as this. Several of them, in addition to attractive colouration and marking on the upper surfaces, have a silver-wash ornamentation underneath. We pass also in our review the very rare Milkweed Butterfly, Marbled White, Small Mountain Ringlet, and Scotch Argus, and this brings us to the Grayling which is thus represented by name both here and in the third volume of this series devoted to reptiles, amphibians, and fresh-water fishes.

Grayling. — (*Satyrus semele.*) This somewhat dull-coloured species seems to be fairly well distributed up and down the country where there is a plentiful supply of heath, or downland, grassy tracks by the sea, and elsewhere. In some Southern Counties, however, it is of rare occurrence. It is on the wing during a great part of Summer, egg-laying taking place in August. Grass-blades or stems are chosen to receive the dull-coloured eggs, but, soon after hatching, the young larvæ go into hibernation until the succeeding Spring, when they commence to feed upon various kinds of grasses. Although the larva has pleasing markings, it is not attractive in colour, and the pupa is deep chestnut. It appears to pupate beneath the ground. The general colouration of the imago may be described as light and dark brown and black, with deckled edges to the wings, and light yellow bands. There are two black spots with white centres on the forewings, and one on each of the hind wings. The under surface of the latter is mottled with greyish and white, whilst the forewings are ochreous, with an orange tinge. It is admirably protected when it alights on the ground, and has the habit of falling on one side to make the illusion more complete.



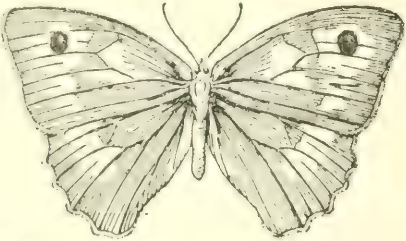
Speckled Wood Fig 5

Speckled Wood. — (*Pararge egeria.*) Whilst I have mostly watched the Grayling Butterfly in some numbers in the grassy fields and waysides bordering the sea at Whitstable in Kent, the present species (Fig. 5) has more often come under my observation in the West Country. One meets with it in plenty along the secluded lanes and woods of Devon and Cornwall, and a charming little fellow it is. Like the Ringlet, it is not a reveller in the sunlight, preferring shade to glare, and may also be noticed flying merrily along even in showery weather. The pale greenish eggs are laid on grasses in early Summer, and the green larva is ornamented with light-edged lines, and a profusion of hairs. The small light green pupa is relieved with other colours, and is suspended from a grass-stem. The mature insect has a drab coat of brownish-black, but the presence of numerous yellow spots on the outer edges of all four wings give it a most attractive appearance, and without being a dandy it is certainly an ornament to the environment it frequents.



Wall Brown (female). Fig 6.

Wall Brown.—(*Pararge megœra.*) There is more than a superficial resemblance between this favourite species (Fig. 6) and its Speckled Wood cousin as they belong to the same genus = *Pararge.* In habits and haunts, however, they differ a great deal, as the Wall Brown is a lover of the sun, and of hot, dry places It is a fairly common insect, but seems to have disappeared from some of its former haunts. From the Autumn hatching, hibernated larvæ feed up in the Spring, pupate, and emerge, the first on the wing being noted during April, or early May. The first batch of light green eggs are laid on grasses in early Summer, and the larva—which is greenish-white, with white dots—feeds upon these latter. The green pupa is adorned with spots and other markings. The outspread form of the imago, as it is seen flying in front of the wayfarer and then settling on a road, path, or wall, will be known to every country dweller. Bright tawny-yellow, with black veinings and spots (the latter with white pupils), is the general colouration, and the insect is such a reveller in the sun that it rests at ease until the observer is close upon it.

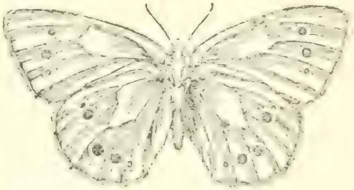


Meadow Brown. Fig 7.

Meadow Brown.—(*Epinephele ianira.*) If the Wall Brown deserves the forepart of its popular English name, the present species, the Meadow Brown (Fig. 7), is doubly entitled to its environmental attachment. It is indeed a meadow-loving insect, and one's mind at once reverts to flower-strewn fields and waysides among which this hesitating flier delights to pass the sunlit hours. It is widely distributed, and may be regarded as one of the most familiar of all. From the time a note is made of the appearance of the first one on the wing in the glad days of June, until the last date is jotted down in September, the Meadow Brown holds undisputed sway of its favourite haunts. Fine or wet weather is equally acceptable, and our country rambles would be far less enjoyable without the presence of this happy-go-lucky species. A grass blade is selected to receive the light-coloured egg, (it should be noted that the eggs of all these insects change colour soon after being deposited), and the bright green larva has a light stripe on either side, and a darker one along the back. The light green pupa has brownish marks and blackish spots, and is secured to a grass stem, part of the last larval skin adhering to the point of attachment. The male is dark brownish-black, with just a splash of yellow, and one spot on the forewings. The female has more yellow in her dress. Both sexes are much lighter below than above.

Small Meadow Brown.—(*Epinephele tithonus.*) This species, also known as the Gatekeeper and Large Heath, is of frequent occurrence, although its season is restricted to the months of July and August. It is, as the forepart of its name implies, smaller than the last species considered, and if this is taken into account, together with its much yellower and brighter attire, all that need be said as to its general appearance is ended. It is more a lover of flower-laden hedgerows than meadows, and shows a partiality for visiting the satin flowers of bramble, and the fragrant blossoms of marjoram. The larva, however, feeds on grasses, whereon also the pale-coloured egg is laid. The former is dressed in light ochre, with brown freckles, a dark line along the back, and a paler one on either side of the body. The pupa is somewhat similar in general colouration.

Ringlet. — (*Aphantopus hyperanthus.*) This insect (Fig. 8) is inseparably associated with the sweet of the year, when the delicate festoons of the bramble are at their best, and Nature is exceeding glad. It is abundantly distributed, and wherever a suitable spot presents itself, it may be sought for with hope of success. It delights in tangled hedgerows and their vicinity, and a grassy common is a very favourite haunt. It is on the wing during July and August, the egg being deposited among grass, but is not attached to it. It is yellowish-white when first laid, but soon changes to light brown. The larva is also the latter colour, with a well-defined line along the back. The pupa is to be found on the ground. It is ochreous-brown in colour, with brown and reddish-brown markings. The dark-coloured form of the imago will be familiar, as also the rings, or spots. These are much more prominent on the under sides of



Ringlet, underside. Fig 8.

the wings. The female is the lighter of the two sexes, and some males are almost black. The slow, fluttering flight, preference for shade or dull weather, and great love for sipping nectar from bramble blossoms, are features of interest.

Small Heath.—(*Cœnonympha pamphilus.*) The Large Heath (*C. typhon*) is restricted to moors of the North, so that its smaller relative must now claim attention. It is the last of the Family *Nymphalidæ* with which we have to deal. The Small Heath is an accommodating little species, as it may often be found resting on some kind of herbage, and may thus be examined at close quarters. It haunts grassy waysides, heaths, commons, and similar places, and is a very familiar butterfly on our country expeditions. May sees the mature insect on the wing, but it is later in the year, when birds are listless and the long days are nigh, that the frolicking little fellow is more frequently met with. The green egg becomes paler as incubation advances, and is deposited on a grass blade. The bright green larva has a dark stripe down the back, and others of lighter colour. The general effect of the pupa is various shades of green, with darker markings. The wainscot-brown of the imago is ornamented above with a spot of black, encircled with white, near the tip of the forewings. The under side of the hind wings is greyish-brown, but the forewings below are much ruddier than on the upper surface.

FAMILY LYCÆNIDÆ

Small Copper. — (*Chrysophanus phlœas.*) The Hairstreaks, and the extinct Large Copper, need not detain us, and we pass on to one of the most delightful little species on the British list. This gay little courtier (Fig. 9) is of active disposition, and seems to take great delight in suddenly thrusting its dapper copper-coloured form under one's immediate observation, as much as to say: "Small I know, but beautiful withal." If impudence and mad frolic do exist in the world of butterfly-life, then this little species with the long scientific name assuredly has it. It revels in wayside places where it can lead a free, unfettered life, and there is a touch of the rover in its nature which makes a strong appeal to the outdoor rambler. It loves flowers, both for the food it obtains therefrom, and to enable it to expand its burnished wings to the full glow of the Summer sun. Late April or early May first sees it abroad, and it is believed to be treble-brooded. The yellowish-white egg is honey-

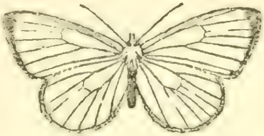
Small Copper Fig 9

comb pattern, and soon changes to greyish. The green larva has prominent segments, but a minute head, the line down the back being brownish-olive. It feeds on dock and sorrel. The pale brown pupa has black dots on the body, as well as streaks of the same colour, and a dark line divides the central parts. The imago has black spots on its copper-coloured forewings, and the dark hind wings are pleasingly relieved with a fringe of copper, freckled with black. The under sides are less showy, although the under surface of the forewings has a bright patch of colour, with black spots.

Brown Argus.—(*Lycæna astrarche.*) Several members of this beautiful series of insects are of rare appearance, but there are three or four familiar kinds worthy of note. The Brown Argus is the first of these, and it is common in the Southern Counties, the principality of Wales, and elsewhere. On a chalk soil, where the sun-loving rock rose flourishes, search may be made for it, but it also frequents one of the cranesbills. May sees it upon the wing, and the whitish egg may be found on the upper side of a leaf. The green body of the larva has a pinkish line down the centre, and another light one along the sides. The polished black head is worthy of note. The yellowish-green of the pupa is ornamented with pinkish edges and bands, and may be sought for, suspended by a silken girdle, on leaves of the favourite food-plant. The dark chocolate colour of the male is richly decorated with reddish-orange spots on both the fore and hind wings, and there is not a great deal of difference in the upper colouration of the two sexes. The under surface is in striking contrast to that which predominates above, the light greyish-brown being enriched with prominent spots. During an evening saunter a number of these butterflies may be discovered quietly resting on grass and other herbage. They do not like windy weather, and take shelter at such times until the conditions are more congenial for flight. The Blues, of which this is one, are proverbial fighters, and their tattered wings testify as to the combats in which they engage.

Common Blue.—(*Lycæna icarus.*) Where there is a plentiful supply of the pretty bird's-foot trefoil, or the pink blossoms of the pungent rest-harrow, search may be made for this species. It has a long flight-season extending from May to September, and the egg is laid on one of the two plants mentioned. At times, however, it appears on other wildlings. It is whitish-green, and bears a white polish. The green larva has a covering of brownish hairs, both short and long, with a dark line down the centre, and a black glossy head. The green pupa is shaded with buff. The blue colour of the male is well-known, and although both sexes are somewhat similar on the under sides, the female is brown above, with black, orange, and white on the outer margins. The light under surface, with its profuse array of spots and prominent veins, is very attractive, and when seen resting with the wings closed (a difficult proposition under certain conditions), the appeal made to the lover of beauty is not likely to be in vain.

Chalk-Hill Blue.—(*Lycæna corydon.*) Where there are heathy chalk downs, cliffs, and similar places, one may expect to locate this pretty species. It is not so well distributed as *L. icarus*, but is much more familiar than the other remaining member of this genus, the Adonis Blue. July and August see it upon the wing, and the whitish-green egg is laid during the latter month. It remains unhatched until the succeeding Spring, when the yellowish-green larva may then be sought for among the dwarf plants that affect open and chalky situations. The male imago is bluish-grey, with an inner edging of black, and black, white-circled spots. There are also white margins to both pairs of wings. The female is sooty-brown, and the markings are somewhat similar to those of her mate, except for some orange colour in their composition. The under sides of both sexes are prominently spotted with black, and the orange markings of the female show through.



Holly Blue Fig 10

Holly Blue.—(*Cyaniris argiolus.*) Holly is the favourite Spring plant of this species (Fig. 10), and where that prickly shrub is found, there one may expect to find it. Other plants—such as dogwood—are resorted to, but holly flowers are preferred in Spring, and ivy in Autumn. It is more frequently met with in the Southern Counties, and becomes rarer further North. In an early season the first Holly Blue is on the wing during the gusty days of March, but it is necessary that the flower buds of the holly shall be well advanced, as upon these and the green berries later on, the larva feeds. The egg is bluish-green or whitish. The life-cycle is not completed until Summer is well under weigh. The larva is prominently segmented, the polished yellowish-green body bearing pale lines, two ridges of humps, and a profusion of small white hairs. The ochreous-brown pupa bears various markings. The pale blue of the male imago is relieved with narrow margins of black, and then an outer edge of white. The female has black patches at the extremity of the forewings, and spots adorn the outer margins of the hind pair. The under surface is very pale cambridge blue, with minute spots of black. This species is double-brooded, and the second batch of eggs are laid in early Autumn on the flower heads of ivy. The pupæ remain as such through the Winter, and from these in early Spring the brood emerges which resorts to holly.

Small Blue.—(*Zizera minima.*) At once distinguished by its size, the Little Blue, as it is also called, restricts its haunts to wind-sheltered dells, hollows in the chalk or limestone hills, and similar retreats. It is the only British representative of its genus, and the last of the *Lycænidæ* with which we are here concerned. Kidney-vetch is the favourite food-plant, and upon a flower-bud of this chalk-loving wildling the pale greenish egg is laid in June. The brown-coloured larva has a polished black head, and is dark-lined down the centre of the back. The pupa is not possessed of much attraction, being of a dull pale hue, with rows of small black spots. The larva remains as such from June to almost the same month the succeeding year. The male imago is dark brown to blackish, with inner surfaces of blue, but the female is the former self-colour all over the upper sides of the fore wings. The under surface somewhat resembles that of the Holly Blue, but the smaller size is a distinguishing feature, and the spots are much more clearly defined.

The Mazarine and Large Blues need not detain us, and the Duke of Burgundy Fritillary is of such local distribution that we can proceed to the last Family, *Hesperiidæ*, which contains the interesting Skippers.

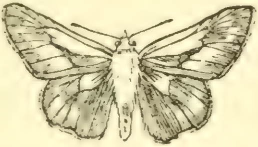
FAMILY HESPERIIDÆ

Grizzled Skipper.—(*Hesperia malvæ.*) This, in my opinion, is the most attractive of the Skippers, and fortunately it is of frequent occurrence. It delights in sheltered commons, downs, and heaths, and towards evening large numbers may be discovered at rest on various kinds of plants, the wings being held erect over the back. The inexperienced observer might reasonably conclude that it was a moth rather than a butterfly, by reason of this habit. Early May sees it upon the wing, and the pale green eggs are strongly netted. The larva has a black head attached to a hairy steel-grey body, and it appears to hide in a drawn-in leaf when about to pupate. The prettily chequered wings of both sexes have an attractive appearance, the blackish ground colour being well adorned with white markings.

Dingy Skipper. — (*Thanaos tages.*) This darker-coloured species is a familiar tenant of grassy places where there is chalk soil, and, when at rest, is still more moth-like than its grizzled relative last described. It flies in May and June, sometimes earlier and later. The whitish-green eggs become orange-colour at a later stage of development, and these are laid on bird's-foot trefoil. The yellowish-green larva has a well-defined line down the back, and a paler one on either side of the body. The dark green pupa has a tinge of pink. The imago is reddish-brown, with white freckled margins to both pairs of wings. The under surface is brownish yellow.

Small Skipper. — (*Adopæa thaumas.*) A profusion of herbage growing in damp situations seems to be the more frequent habitat of this species, and it is of common occurrence. The white egg becomes yellowish, and then reverts to a paler colour again. Several are deposited in a small cluster on the taller grasses, and when the green larva is ready to pupate, it encloses itself by fastening several grasses together in a silky covering. The pupa is also green, and as with the larva, lines and stripes are plainly discerned. The perfect insect has brownish-orange wings, with dark venation, and the male has a slanting black line on the centre of the forewings. The under side is pale tawny.

Large Skipper. — (*Augiades sylvanus.*) None of the remaining Skippers on the British list need concern us, excepting the present species (Fig. 11), which is of such general distribution as to be worthy of inclusion. Like its congeners it revels in grassy situations, and is on the wing during June and July. The light-coloured egg is deposited on a grass-blade, and the larva hides until the following Spring. It does not commence feeding until then. The brown pupa is spun up among grass. The thick dark body of the imago gives the Large Skipper a



Large Skipper Fig 11

moth-like appearance, the general colouration being yellowish-brown, with strong venation. The male has a black upward mark on each of the forewings, and the female is lighter and yellower than her mate.

BRITISH MOTHS

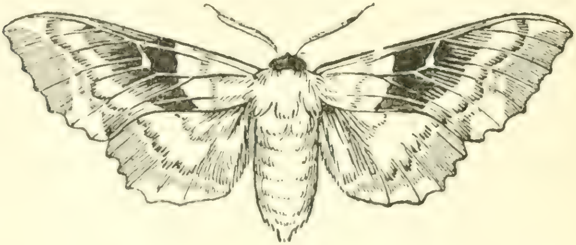
Introduction.— There are more than two thousand species of British Moths, and whilst it is impossible to mention these even by name, a careful sortation has been made of a representative selection from the chief families, with the idea that sufficient interest will have been created to set up a desire on the part of the reader to follow up the matter further on his own account. As moths so closely resemble Butterflies in their general life, habits, and structure, it is not necessary to recapitulate same here, but to devote the remaining space at disposal to a consideration of the species to which it is thought desirable to draw attention. The first Family—the Hawk Moths—happens to be a particularly attractive one, and even among confirmed country dwellers much interest is aroused when one of these fine insects is captured At times the interest actually grows into fear, and that on the part of people who ought to know better. Thus, a local policeman brought to me in custody a beautiful specimen of the Eyed Hawk Moth last Summer, and was very much alarmed when I at once opened the box in which it was contained, and gave the prisoner its liberty. If the poor constable was frightened at the release of such an innocent six-legged prisoner, one trembles to think what would happen if a real offender, with a less number of legs, came under his control. The handsome Lime-Hawk is the first species upon our list, and to this attention may now be directed.

GROUP SPHINGES

FAMILY SPHINGIDÆ, OR HAWK-MOTHS

Lime Hawk-Moth. — (*Dilina* (*Mimas*) *tiliæ*.) This moth (see Frontispiece) should be sought for wherever limes—its favourite food-plant—abound, its chief strongholds being in the South, as it becomes rarer in the Midland and Northern Counties. It may be sought for in May and June in the neighbourhood of the trees it frequents as an egg-depositing site (limes and elms), and thereafter (July and August) the striped larva may also be located. These long-tongued insects, it should be remembered, are night-revellers, and only flowers having a long corolla tribe are, as a rule, visited. Consequently, the imago is rarely seen, unless accidentally discovered when at rest. The one or two eggs are laid on the under sides of the leaves, and the green larva has seven yellow stripes on each side of the body, with a curved horn on the extremity, a peculiarity present on all the Hawk-Moth tribe. The chocolate-coloured pupa may be found under ground beneath the food-plants, or hidden among the crevices of bark. The sharp-cut wings of these Hawk-Moths (so-called because of these, and the swift, strong flight), are a characteristic feature. Brown, greenish, and yellow may be given as the variety-colours of which the perfect Lime-Hawk is made up, and there is a whitish mark near the tip. The skittle-shaped body is also worthy of mention.

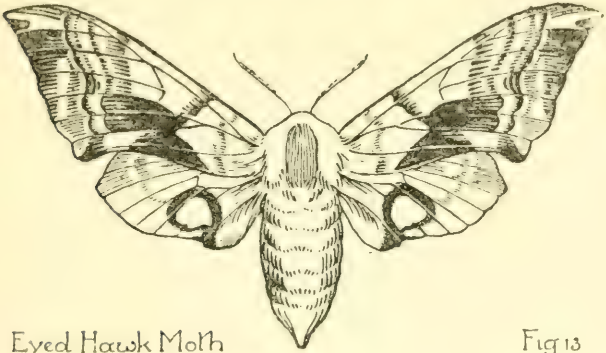
Poplar Hawk-Moth.—(*Smerinthus* (*Amorpha*) *populi.*) As its popular names indicates, this species (Fig. 12) is addicted to poplar trees, although sallows (including willows) are also frequented. It is said to be our commonest Hawk-Moth, and has a much wider distribution than the last species. As a rule, it is on the wing during May and June, but in a late season it makes, in consequence, a later appearance. The polished green egg may be found singly, or in small batches, on the under side of a leaf, and the green larva has seven yellow stripes on either side of its body, with the characteristic horn on the hind segment. The blackish pupa is hidden away just below the surface of the ground. The general coloura-



Poplar Hawk Moth Fig 12

tion of the imago is not attractive, but it has a quiet refined beauty of its own. Light brown and grey, with a patch of bright chestnut on the inner side of the hind wings, and a white spot on the front pair, may serve as a brief description.

Eyed Hawk-Moth.—(*Smerinthus ocellatus.*) This species (Fig. 13) belongs to the same genus as the last-named, and has a somewhat similar distribution to the Lime-Hawk, being rare outside the Southern Counties. June should see the perfect insect on the wing, and the yellowish-green eggs are laid upon sallow and willow, though other plants are also resorted to. Each egg is attached to the leaf by a sticky substance, and it is said that one female will probably deposit not less than four hundred eggs. The green larva has seven oblique side stripes of white, and the horn is bluish. It should be sought for during July and August. When full-fed it descends the bush, or tree, where it has been feeding,



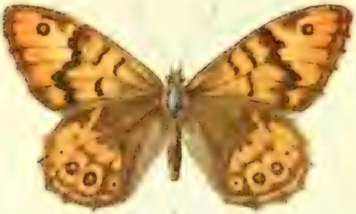
Eyed Hawk Moth Fig 13

and burrows into the soil ready to pupate. The brownish pupa is smooth, and somewhat polished. The two "peacock" spots, or eyes, on the pinkish hindwings at once distinguish this species, and make confusion impossible.

The rare Death's Head Hawk-Moth (so-called because of the curious skull markings on the thorax of the imago), Convolvulus Hawk-Moth, and several other rarities need not detain us. This leaves us to deal only with the remaining British species likely to be encountered, namely, the Privet Hawk-Moth.

Privet Hawk-Moth.—(*Sphinx ligustri.*) This species is also apparently restricted to the South of England, and even where privet abounds it does not always appear. It may be expected abroad in July and August, and the larva may occasionally be found on garden shrubs. The eggs are laid along the under side of the midrib, and when the handsome larva is full-fed it is quite three inches long. Green in body-colour, with stripes of heliotrope and white, and a prominent curved horn, it is a striking object to encounter. The larvæ of all these Hawk-Moths bear noticeable spiracles on the sides of almost all the segments. The dark-coloured pupa is hidden below ground, and a little pit is hollowed out large enough to contain same. The moth does not emerge until the following Summer. When it does so, a very beautiful creature is to be seen, the chief feature of which is perhaps the black and red bands on either side of the abdomen, the wings being of wide stretch and pale brown in colour, ornamented with black bands and streaks, and a tinge of pink.

PLATE II.



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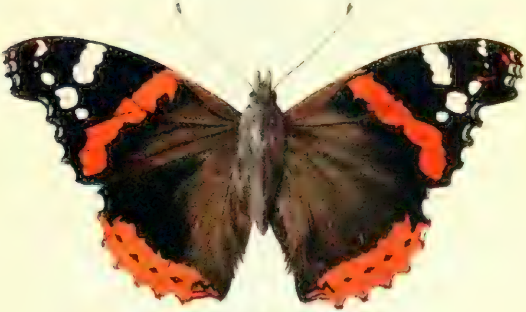

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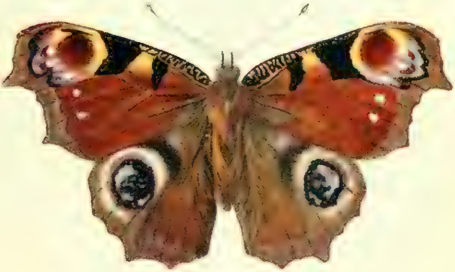


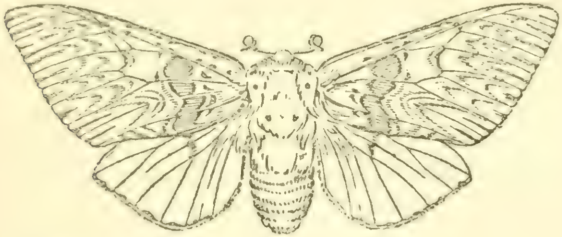
3

1. Wall Brown Butterfly. 2. Red Admiral. 3. Peacock Butterfly

GROUP BOMBYCES

FAMILY NOTODONTIDÆ

Puss Moth.—(*Dicranura vinula.*) As each Summer draws near excitement prevails among my boy (and girl) friends at the prospect of securing eggs, or larvæ, of this most interesting species (Fig. 14). Its predecessors in scientific order are the Kittens, but it is only a coincidence that these should be followed by the Puss when, as a matter of fact, it should rather be the reverse! However that may be, the latter is undoubtedly a popular favourite among those young people who rear these creatures, and to whom the curious form of the Puss Moth larva, and the cocoon it weaves, make a special appeal. It is of wide distribution, and wherever poplars



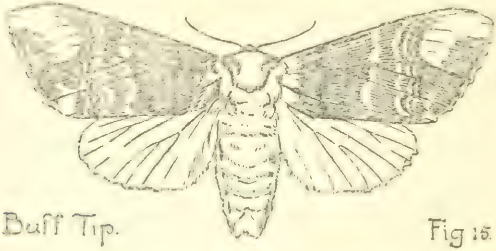
Puss Moth Fig 14

are found one may expect to locate it. Sallow and willow are also frequented, and the eggs (usually two in number) are laid on the upper (not the under) surface of the leaves. When first hatched, the small fluffy black larva hardly seems capable of evolving into the large formidable creature of later days, but as it feeds ravenously it increases in stature, and becomes more interesting at each successive stage of development. When it is full-grown, the larva has a large black and red face, a hump at the back of the head, and a body that tapers perceptibly towards the curious whisp-like "tail." The green colour is relieved with a dark band on the back, with light edging. I have watched the larva prepare for pupation under very favourable circumstances, and on one occasion it performed the operation in a small wooden box which I carried in my pocket. When I showed the full-grown larva to an eager class of boys at three o'clock one July day, it crawled about my hand (and theirs!), but an hour later, when I prepared to exhibit it to a class of girls, it had actually entombed itself in a cocoon composed of tiny portions of the wooden lid, had coiled itself up, and was ready to go to sleep. It had scooped out a hollow in the lid of the box with its strong jaws, and the particles of material secured had been glued together into a thimble-shaped cocoon which was already quite hard. A reddish-brown pupa was eventually contained within the cocoon, but I had to wait until the following May before the perfect insect emerged from the shroud, the old pupa case remaining inside. In a natural state the cocoon is found on the trunks of trees, palings, and similar places, but it needs a practised eye to discover it. The imago is light grey in colour, with prominent brown veins, and the head is covered with fluffy material which accounts presumably for its popular name. The device adopted inside the cocoon, so as to enable the perfect insect to make its safe exit, is very interesting. Care is taken to ensure that the head end of the cocoon shall be so constructed as to show the least resistance when emergence of the imago is due, and even the pupa has an apparatus by means of which it can lend a hand to its later self by partly cutting a hole ready for the final escape.

Pebble Prominent.—(*Notodonta ziczac.*) This small species is of common occurrence in Britain, but prefers water-logged areas where there is a plentiful supply of herbage. It may be expected upon the wing in May and June, and the usual food-plants are poplar, sallow, and willow. The ochreous-grey larva may, or may not, have a pinkish or yellowish tinge ; there is a stripe of yellow down the back, and a dark line along the sides. The reddish-brown pupa is hidden below ground in a cocoon made of earth. The imago is various shades of brown on the forewings, with light greyish hindwings in the male, and darker in the female.

Coxcomb Prominent.—(*Lophopteryx camelina.*) This light brownish moth is a very common species, and is given to considerable variation. It is first on the wing in May and June, and haunts beech, birch, hazel, oak, and sallow bushes and trees, the whitish egg being deposited on the under side of a leaf. The green larva has a well-defined line down the back, and yellow along the sides, with two reddish protrusions on the eleventh segment. It is double-brooded, the second succession appearing in July and August.

Buff-Tip.—(*Phalera bucephala.*) The Buff-Tip (Fig. 15) is so-called because, as the name implies, the edges of the forewings are tipped with buff as if, when handling, the scaly-dust had been thumbed off. There is a double row of perpendicular wavy lines plainly dividing the buff-tip patch from the purplish-brown markings of the remaining portion of the forewings, the hindwings being whitish. June and July sees it abroad, but it is a typical night-flier, and so harmonises with its surroundings, and assumes such a position, that detection by day is a difficult problem. The whitish eggs are laid in batches, and the somewhat furry larva is found on several different kinds of bushes or trees in early Autumn. The larva is yellow in colour, but has a black head and lines, that along the back being the most prominent. I have seen whole branches of oak trees stripped of their leaves by a colony of these ravenous larvæ.

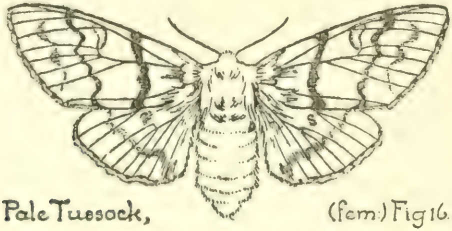


Buff Tip. Fig 15.

FAMILY LYMANTRIIDÆ, OR TUSSOCK-MOTHS

Vapourer.—(*Orgyia antiqua.*) Of general distribution, the Vapourer Moth is nevertheless of great interest because the female only possesses rudimentary wings, and is incapable of flight. It is not at all particular as to its food-plant, and is found in our large cities as well as in the heart of the country. The pale brownish eggs are deposited in batches on the remains of the cocoon, and each egg is indented at the top. They do not hatch until the succeeding Spring, and Tits do an immense amount of good in searching for and devouring them during Winter time. The violet, or greyish, larva is characterised by the possession of four little brushes, or tussocks, of hair which has given this family of moths their popular name. The somewhat hairy pupa is blackish in colour, with a pronounced polish, and it is enclosed in a silky cocoon suspended in sundry places. The male imago is reddish-brown, with a white spot on each of the forewings. The wingless female is smoke-grey.

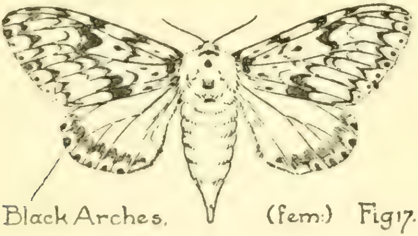
Pale Tussock.—(*Dasychira pudibunda.*) This species (Fig. 16) seems to prefer the Southern Counties, but also occurs elsewhere, though unknown in Scotland. It appears in May and June, and delights in bracken-covered areas near woods. The larva, however, feeds upon birch, hazel, hop, oak, and other leaves from July onwards. It is green, or yellow, in colour, but five tussocks of yellow hair, and the profusion of it elsewhere on the body, are distinctive features. There are also black spots and markings. The male imago is greyish, with dark powdery frecklings, and a dark body. The female is larger, and lighter-coloured. The hindwings are greyish, suffused with darker tints.



Pale Tussock, (fem:) Fig 16.

Gold-Tail.—(*Porthesia similis.*) This is a very familiar species, and the black larva, ornamented with rich red and snow-white, is a common object on hawthorn during the early days of Summer. It is a sluggish creature, and may be readily picked off by hand. Large numbers must fall a prey to insectivorous birds, though, as has been previously mentioned, the feathered tribe are not, as a rule, partial to hairy larvæ. The clusters of eggs may be found in June and July, and the brownish pupa is fringed with hairs. The larva hibernates in a silky envelope soon after August, and remains quiescent until the Spring, when it commences to feed again. The pure white imago has a powdery body, with a gold or yellow tip on the abdomen, hence its popular name.

Black Arches.—(*Lymantria monacha.*) This pretty moth (Fig. 17) is fairly well distributed in various parts of England and Wales, but is rare in the North. It resorts to trees, and the eggs are deposited among rough bark. The moth is on the wing in late July or August. The larva varies from greyish to whitish, and has a dark central stripe down the back, with other markings of black, and perhaps dots of red. There is a greyish patch on either side near the head, and another on the back which interrupts the middle line. There is also a profusion of hairs. The food-plants consist of apple, pine, oak, and other leaves. The brownish pupa has a polished appearance, and is hidden in a silky cocoon through which it can almost be seen. Both sexes are prettily decorated with black and white markings on the forewings, and greyish on the hind ones. The female is the larger of the two, and has bands of red and black on the abdomen, terminating in a point.



Black Arches. (fem:) Fig 17.

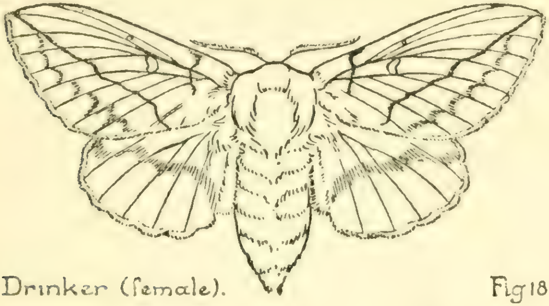
FAMILY LASIOCAMPIDÆ, OR LACKEYS AND EGGARS

Tree Lackey.—(*Malacosma neustria.*) The tents of this species containing a wriggling cluster of larvæ will be known, at least by sight, to country dwellers. It seems to occur especially upon hawthorn, and in some seasons tent after tent can be seen suspended along a hedgerow over an area of several hundred yards. Unfortunately, it also has a liking for taking up its position on fruit trees in garden and orchard. Under such conditions, the tent and its living contents should at once be destroyed. The period on the wing is July and August, the greyish-brown eggs being cleverly secured to a twig in the form of a band. When found during Winter (for the eggs thus remain until the following Spring), they also should be burnt out of the way. The slaty-blue larva has a bluish-white line down the back, with a border stripe of black on either side, lined with reddish-orange. The dark pupa is hidden in a silky cocoon, which has an inner chamber of the same material. The imago is light yellowish-red, with well-defined cross lines on the forewings. This species, however, is very varied in both colour and markings.

Small Eggar.—(*Eriogaster lanestris.*) This species is much smaller than the one which follows, and belongs to a different genus. It is a familiar enough insect in the Southern Counties, but becomes much rarer further North. Blackthorn and hawthorn are the favourite food-plants, and upon the branches of these the groups of green eggs are laid early in the year. The eggs are protected with hairs which the female moth secures from the extremity of her own body, she being provided with a tuft of these which is absent in the male. The gregarious larvæ are contained within a silky web suspended from the food-plant, and unless coming out to feed, they keep closely to the inside of their habitation. The dark, almost black, larva is adorned with tufts of reddish-brown hairs, and on either side there are blotches of yellowish, or reddish-brown with edges of black. The brown pupa is contained within a light-coloured cocoon, and it sometimes happens that several years are passed in the pupal state before emergence of the perfect insect takes place. The male is the smaller of the two sexes, and is of brownish colour with fairly conspicuous veining, with a white spot on the forewings, and a transverse band of the same upon both pairs. The female may be known by her larger size, and the possession of a greyish tuft of hairs on the end of the abdomen as already referred to.

Oak Eggar.—(*Lasiocampa quercus.*) This much larger species has a wider distribution in Britain, and there is a Northern form (*Calunæ*), occurring in England and Scotland, the larvæ of which I have found in abundance feeding on heather in Glen Douglas, Loch Lomondside. *L. quercus* is on the wing in July and August, haunting commons, heaths, hedges, the margins of woods, and sea coast. The larva is a handsome furry creature, and may frequently be noticed on grass by roadsides. It is brownish in general colouration, with jet black rings, a white stripe on either side, and a profusion of hairy tufts all over the body. It has the unfailing habit of coiling up when disturbed. The hard, purplish-brown pupa is hidden in a cocoon of oval shape, and to this is attached a silky coverlet which enables the owner to spin itself up to some surrounding object on, or close to, the ground. The male imago is much darker and smaller than the female, being chocolate-brown on three-fourths of the upper surfaces, with a light spot on the forewings. There is a light dividing line of yellowish, followed by an outer edging of brown. The female is almost uniformly dressed in light brownish-yellow, and the head, thorax and abdomen are covered with thick "down." The venation of the wings is also very pronounced. As a rule, it takes a full year for this species to complete its life-cycle.

Drinker. — (*Cosmotriche potatoria.*) This common species (Fig. 18) resorts to grassy hedgebanks and similar places, and is on the wing in July. The white eggs, marked with bluish-grey, are deposited in small batches on the stems of grass and other herbage. The larva hibernates through the Winter, but commences feeding again in Spring, and by the time the Cuckoo comes in April this bird of wandering voice finds an abundant food-supply close at hand. The bird in question is very fond of these larvæ, and may be observed making a hasty meal of them soon after its arrival from overseas. The larvæ seem to prefer feeding on grass blades and other succulent herbage after a shower of rain, when they may be sought for and found in plenty. It is a hairy larva, and is apparently fond of sucking up moisture, hence its popular name of Drinker. The larva is dark-coloured, with a profusion of light markings along the back, and prominent tufts of hair on the sides. Near the head, and also at the anal end, there is an erect brownish tuft. The brown pupa is enclosed in an elongated cocoon of light colour, and this is attached to a grass or reed stem.



Drinker (female). Fig 18.

The imago is light reddish-brown, with two silvery marks on each of the forewings. The female is more yellowish than her mate.

Lappet.—(*Gastropacha quercifolia.*) This species is noteworthy because of the size of the full-grown larva, which may assume a length of several inches. It is of general occurrence except in the North and in Ireland, and deposits its piebald eggs underneath the leaves of apple, blackthorn, hawthorn, sallow, and other plants. The moth is on the wing in June or July, and the eggs are laid in July or August. The larva hibernates during

Winter, but recommences feeding in Spring. It then makes amends for its fasting, and attains the proportions above mentioned. It is a dark, hairy larva, and is calculated to cause some alarm to the unwary. The pupa is also dark-coloured, but looks lighter because it is dusted with a permanent whitish substance. It is hidden in a lengthy cocoon of silk and hair which is attached to the food-plant. Both sexes are almost identical in the perfect insect, the male being the smaller of the two. Warm reddish-brown is the prevailing colour, with a tinge of greyish, and prominent venation. The outer edges of all four wings are deckled. The bipectinate antennæ (having a double row of hairs) is a conspicuous feature, and the way in which the forewings are allowed to lap over the hind ones like tiles on a roof when the moth is at rest, is worthy of special mention. The handsome Emperor Moth, and the Hook-Tips (which have curious hooked tips on the forewings) come next, but we pass by these and others until we reach representatives of the next Family upon our selected list.

FAMILY ARCTIIDÆ

White Ermine.—(*Spilosoma menthastri.*) This common species will be familiar to country or town dwellers, and is often found in gardens during June. The furry larva may be sought for in Autumn, and may be known by its brown coat, and prominent stripe of reddish adown the back. It is not particular as to its food-plant, and will readily take anything that is going. The dark brown pupa is fitted into a cocoon of silk, and this is spun up in any convenient place. The imago is white, or creamy-white, with black specks (mostly on the fore-wings), and has a furry head and thorax, and yellowish abdomen.

Buff Ermine.—(*Spilosoma lubricipeda.*)—Cousin of the White Ermine, and as the popular name indicates, buff, instead of white, in colour. Otherwise, the resemblance in size and markings is almost the same. The eggs are pale-coloured, and are deposited in clusters on the leaves of various plants either low or tall growing. It is of frequent occurrence in gardens. The larva is similar in form to the last mentioned, but the centre stripe is not so conspicuous, and there are lighter stripes on the body-sides. The reddish-brown pupa has a polished effect, and is encased in a poorly made cocoon which may be found on, or close to, the ground.

Garden Tiger.—(*Arctia caia.*) This striking species (see Frontispiece), adorned in yellow forewings, with patches of rich chocolate-brown, and scarlet hindwings marked with bluish-black blotches, is every boy-collector's prize. Yet it is a common species, and the hairy larva—called the woolly-bear—is often discovered feeding upon stinging nettles, or crawling along the ground when full-fed, to find a suitable spot in which to hibernate. It is on the wing in July, and will deposit its eggs upon several kinds of plants. Although it will, when kept in confinement, perform its change from larva to imago within a few weeks' time, almost under one's eyes, the larva, as indicated, passes the Winter in a state of suspended animation until the following Spring. The mature insect is subject to much variation in colour, and when reared in captivity some very striking examples are likely to be obtained.

Cinnabar.—(*Hipocrita jacobææ.*) Wherever there is waste ground, or flower-laden wayside and heaths, this striking little species (see Frontispiece) may be met with. It has its off and on seasons in a similar way to many other butterflies and moths, but in a good year the orange and black banded larvæ may be found in numbers on ragwort during July and August. The pupa is reddish-brown, and is enclosed in an apology for a cocoon which is hidden on the surface, or just underground. The imago in both sexes is dark brownish on the forewings, with a line and two spots of scarlet, and the latter, bordered with a fringe of dark colour, almost entirely covers the hind ones. It is not a strong flier, and is easily captured.

The little moths called Footmen come next, some prettily attired, others of unattractive colouration, but we shall now make acquaintance here with our first member of the *Noctuæ*, or Noctuids, in the person of the Poplar Grey Moth, belonging to the Family *Acronyctidæ.*

GROUP NOCTUÆ

FAMILY ACRONYCTIDÆ.

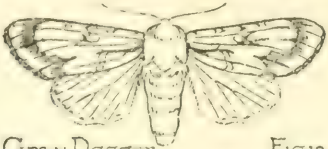
Poplar Grey.—(*Acronycta megacephala.*) This familiar little species—greyish-brown in colour on the forewings, whitish on the hind ones—is partial to poplar leaves, and is common in town and country all over the United Kingdom. It flies from May onwards, and the hairy larva is brownish-grey, or ochreous, in colour, with darker markings. The hairs are whitish and especially long on the sides of the body. There is a prominent patch on the tenth segment.

Dark Dagger.—(*Acronycta tridens.*) Belongs to the same genus as the last-named. Like the Grey Dagger, (*A. psi*) its near ally, it is of wide distribution, and is found on a variety of food-plants, such as apple, birch, blackthorn, hawthorn, pear, plum, and sallow. It is rare in Ireland and Scotland.

It is out and about in June, and the black larva has three reddish stripes, one down the back, and one upon each of the sides. There are humps on the fourth and eleventh segments. The imago is greyish on the forewings, with black dagger-like markings, and whitish on the hindwings.

Grey Dagger.—(*Acronycta psi.*) In all respects except the larva, this species (Fig. 19), is identical with *A.*

tridens. Instead of having a reddish stripe down the back, that of this species is bright yellow, margined on either side with spots of red.



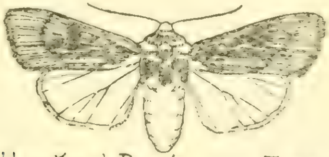
Grey Dagger Fig 19

FAMILY TRIFINÆ

Turnip. — (*Agrotis* (*Euxoa*) *segetum.*) Of wide distribution, haunting fields of swedes and turnips, this moth is a farmer's pest. It is preyed upon, and its numbers thus kept in check, by Starlings. I have seen large companies of these sagacious birds searching industriously for the larvæ, and clearing whole areas of affected plants. It feeds for several months, and attacks both leaves and bulb. The greyish-brown larva is variously marked with glossy spots, dark lines, etc. Both sexes of the imago are much alike, the forewings being yellowish-brown, and the hindwings whitish.

Heart and Club. — (*Agrotis* (*Euxoa*) *corticea.*) June and July sees this fairly well distributed species on the wing, and it feeds in March and April on such plants as clover, dock, goosefoot, knot grass, and other persicarias. It haunts waste places, or wherever these plants flourish. The larva is greyish-brown, with a pale line along the back, and then a single and double one on the sides. Pale brownish-red, with darker markings on the fore-wings, and paler on the hind ones, is sufficient description of the perfect insect. Both sexes are of close resemblance.

Heart and Dart. — (*Agrotis* (*Feltia*) *exclamationis.*) This little moth (Fig. 20) with the terribly long scientific name, is of the same genus as its Heart and Club cousin, and is of common occurrence. Its flight season is the same, and the larva partakes of somewhat similar vegetation, though chickweed, lettuce, plantain, and turnip should be added to the bill of fare.



Heart and Dart Fig 20

The brownish larva has darker blotches down the back, and the black spiracles—or breathing holes—are a prominent feature. The imago is very similar to the Heart and Club, but the hindwings are almost white.

Setaceous Hebrew Character.—(*Noctua c-nigrum.*) In spite of its forbidding English name, this is a common species, and the larva does good in feeding upon various kinds of weeds. The imago is abroad from May to Autumn. The pale larva is streaked with black, and has a well-defined line, with dark margins, down the back.

There is also a yellowish, or whitish, stripe, with black edges, underneath the spiracles. The imago is greyish-brown, with a curious black mark near the outer edge of the forewings, succeeding one of yellow. The hind-wings are light yellowish, or buff.

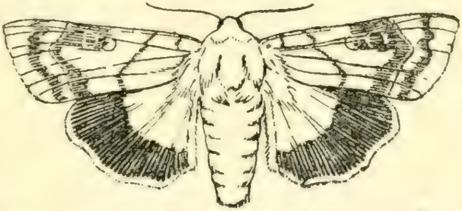
Square-Spot Rustic.—(*Noctua* (*Segetia*) *xanthographa.*) This is a very common moth of wide distribution. Early Autumn sees it first up on the wing, and the larva feeds upon bedstraw, dock, plantain and other dwarf plants from August to May, hibernating in Winter. The larva is brownish, or yellowish, with darker marking, and pale lines down the back. There is a dark stripe on the lower part of the sides. It is impossible in many of these descriptions of the imagoes to give particulars of the variety they display, and this species is no exception in this respect Generally, it may be stated to be light brown on the forewings, with a square spot and another mark, which may, or may not be, conspicuous. The hindwings are light-coloured, with a dark edging, but the female is darker.

Flame Shoulder.—(*Noctua* (*Ochropleura*) *plecta.*) May and June, and again in August and September, sees this little species on the wing, as it is double-brooded. The brownish larva, variously lined and marked, feeds upon both wild and garden plants. The imago may be compared to a smaller edition of Setaceous Hebrew Character which, except in the darker colour of the body, it closely resembles.

Large Yellow Underwing. — (*Triphæna* (*Agrotis*) *pronuba.*) This is a pest of the garden, and in spite of its pretty appearance its numbers should be kept under. It is of common occurrence, and often flies in the open window to light during Summer evenings. The eggs are laid on various kinds of low-growing plants (wild and garden), and the brownish larva has yellowish lines down the back, with bars of blackish on segments four to eleven. The imago is greyish-brown on the forewings, with bright yellow and black borders below.

The Lesser Yellow Underwing is, as its name implies, smaller than the last named, and is similarly coloured, except for less ornate forewings, and the addition of a dark mark on the upper part of the hind ones. The colour and markings are, however, subject to considerable variation.

Broad-Bordered Yellow Underwing. — (*Triphæna fimbria.*) This species (Fig. 21) is on the wing during June and July, and is well distributed in wooded regions. The larva feeds on various kinds of herbaceous and woody plants in Spring and Autumn. The dark brownish pupa has two short spikes at the extremity. The broad border of dark brown on the hindwings, and deeper yellow, distinguishes this species from its relatives.



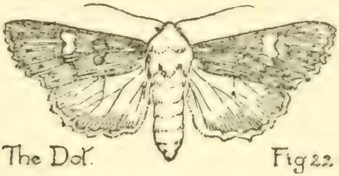
Broad-bordered yellow underwing. Fig 21

Lesser Broad-Bordered Yellow Underwing.—(*Triphæna* *ianthina.*) July and August sees this smaller species on the wing, and it frequents hedgerows, lanes, and woods. It is of common occurrence, and the larva feeds on various kinds of plants such as bramble, dock, elm, hawthorn, primrose, and sallow. It is brownish in colour, with a greenish tinge, and has a light line down the back, and some dark markings inclining to blackish. There is a pale yellowish stripe underneath the white spiracles. The smaller size distinguishes it from its larger cousin last described, and the broad border, and darker colour of the forewings, mark it off from the Lesser Yellow.

Least Yellow Underwing.—(*Triphæna interjecta.*) The last member of the genus is, as its name indicates, the least of all in the matter of size. It is of fairly general distribution, and haunts similar places to *T. ianthina*, but is not so fond of woods. It is abroad during July and August. The ochreous-brown larva bears black dots; there is a stripe of brown down the back, with a whitish centre, and a similar stripe on the sides, with a whitish margin above. Food-plants closely resemble those of preceding species. The forewings are dull reddish-brown, and the light yellow hindwings have the characteristic dark border, with an outer edging of yellow as in the others.

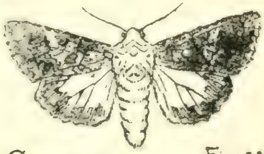
Cabbage Moth.—(*Barathra brassicæ.*) This is a very familiar species all over the country, and flies in June and July. It feeds on almost any suitable plant found both in and out of the garden, and does not exclusively restrict attention to cabbages. The larva may be discovered from July to late Autumn, and is dull brown, or greenish, dotted with greyish, or a tinge of green. The dusky stripe along the back has white specks, and the side-stripes may be greenish, dingy brown, or yellowish. The imago has greyish-brown forewings, with much lighter hindwings, veined with brown.

The Dot.—(*Mamestra persicariæ.*) This is a town and country dweller (Fig. 22), and is fairly well distributed in England. It is rare in both Ireland and Scotland. The haunt is unrestricted, and wherever there is a suitable food-supply of low-growing plants, there is a likelihood of its appearance. The moth is on the wing in July and August, and the larva appears from the latter month onwards. The larva is pale-coloured, with darker markings. The sooty-grey forewings of the imago have a characteristic white dot, from which the species obtains its popular name, with the edges deckled. The hindwings are fawn-coloured, with conspicuous veining.


The Dot. Fig 22.

Bright-Line Brown-Eye.—(*Mamestra oleracea.*) At a later stage we shall make acquaintance with the Brown-Line Bright-Eye. On this occasion we reverse the order to deal with the Bright-Line Brown-Eye which, being confusing, shows the necessity for, and use of, scientific names. It is a common species. Inland the larva may be found feeding on dwarf-growing plants, such as goosefoot, but on the coast the beautiful feathery foliage of tamarisk is eaten. The larva varies from green to pale brown, with black and white dots. The white spiracles have black edges, and they run along the blackish margin of a stripe of yellow. A treble line of greyish appears down the back. The imago has a bright line on the edge of the reddish-brown forewings, and a brownish, or yellowish eye. The hind wings are light greyish, with conspicuous veins.

Broom.—(*Mamestra pisi.*) This is a larger cousin of *M. oleracea*, but it is ill-named, as the larva does not restrict attention to the broom, feeding also upon bracken, bramble, sallow, sweet gale, and wild rose. As a general rule, the larva is brown or green, striped with yellow, and feeds in August and September. The imago is on the wing in June and July, and is a very familiar object almost everywhere. It is reddish-brown on the forewings, with greyish on the hind ones. There is a wavy yellow line on the margins of the upper pair.



Campion. Fig 23

Campion.—(*Dianthœcia cucubali.*) Holes in the leaves and seed vessels of the campion and allied plants are caused by the larva of this moth (Fig. 23), and it is named after the plant in question. It is of general distribution, and should be sought for where campion abounds.

The moth flies in June, and a second brood in August. The greenish larva has a greyish-brown line down the back, with orange-brown marks on the back shaped like the letter V, and slanting ones of the same colour on the sides. The imago is reddish-brown on the forewings, prettily picked out with yellow, and greyish on the hind ones.

Tawny Shears. — (*Dianthœcia carpophaga*) Belongs to the same genus as the last-named species, and the larva (purplish-brown, with ochreous-brown lines down the back), feeds on similar plants. It should be sought for in June, July, and September. The imago is on the wing in May and June, or later, and varies from pale yellowish to ochreous-brown on the forewings, with lighter colour below. The lighter varieties appear to favour one or two of the Southern Counties, and the darker ones occur elsewhere, as well as intermediate forms.

Feathered Gothic. — (*Epineuronia popularis.*) August and September sees this greyish-brown moth at large, the hindwings being a good deal lighter. It is a common species in town and country, and the male is fond of coming to light. Curiously enough, the female is unattracted in this way. Wherever there is a patch of rough grass in an open situation the larva of the Feathered Gothic is likely to be encountered, as it is a grass-feeder. The larva is dark greenish-brown, with various markings, and should be sought for in Spring, as the eggs, laid several months earlier, then hatch. The larva goes on feeding until mid-Summer.

Figure of Eight.—(*Diloba cœruleocephala.*) This moth

(Fig 24), so-called because of the markings on the fore-wings, has a fairly extensive range in England and Ireland, but is rarer elsewhere. It comes abroad late in the year, and Michaelmas has usually gone by before it appears. It haunts bushes, gardens, hedgerows, and other spots where it can safely deposit its eggs, the food-plants consisting of the leaves of apple, blackthorn, crab, hawthorn, plum, etc. The larva is bluish-grey, profusely spotted with black dots and spots, and there are yellow stripes on the back and sides. The purplish-brown pupa is enclosed in a cocoon, and is cleverly camouflaged so as to remain undetected. The greyish-brown forewings of the imago bear the curious figure-of-eight markings. The hindwings are whitish.

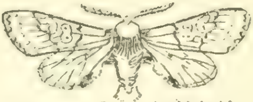


Figure-of-eight Moth.
Fig 24.

Straw Underwing.—(*Cerigo matura.*) Wherever conditions are suitable this is a common species. It is on the wing in July and August, and it is then the eggs are laid. The larva remains as such all the Winter, and pupates in Spring. It feeds upon grasses, and is reddish-brown, or yellowish, with brownish-grey central marks, bordered with a line having brown margins on either side. There is a pale line on either side of the body, with an upper edging of brown. The reddish-brown forewings of the imago are ornamented with darker markings, but the pale yellow, or straw colour, of the hindwings is a distinguishing feature.

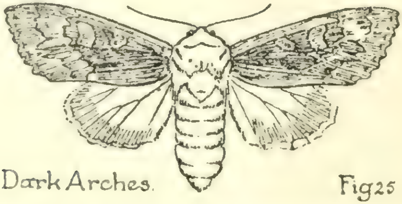
Marbled Minor. — (*Miana strigilis.*) This common moth is of general distribution, and is on the wing in June and July. The larva feeds on grasses in early Spring, after passing the Winter in a state of torpor. It is purplish-brown on the upper parts, and ochre-colour beneath, with a pale yellow stripe down the back, and another on either side. The black spiracles are conspicuous. The imago is subject to great variation, but a general description might be reddish-brown, or greyish-brown, on the forewings, with lighter on the hind ones. It also varies in size, but not so much as in colour.

Dusky Brocade.—(*Apamea gemina.*) This reddish-brown species, with freckled forewings, and plainer, strongly-veined hindwings, is more or less encountered where there is a profusion of grass growing in damp localities. The larva feeds upon grass, commencing in Autumn, and finishing the succeeding Spring. It is brownish-grey, with a line and stripes on the back, and another stripe on the sides.

Rustic Shoulder Knot.—(*Apamea basilinea.*) Cousin of the last mentioned, but decidedly more numerous. The food plant and feeding period resemble that of its cousin *A. gemina*, and the moth is on the wing in May and June. The pale olive-brown to greyish-brown larva has a lighter line down the back, with black-lined margins, and other markings. The imago is yellowish-brown on the forewings, and the hindwings are paler. There is a black mark at the lower edge of the former from which the popular English name is derived.

Common Rustic. — (*Apamea secalis.*) Of common occurrence almost all over the country, and appears on the wing in July and August. The green larva has three lines of reddish down the back, and feeds on grass, rush, etc. The imago is subject to great variation. A general description might be brownish, reddish, or yellowish forewings, with a light mark on each; much lighter on the hind ones.

Light Arches. — (*Xylophasia lithoxylea.*) No apology is needed for introducing such difficult scientific names in an avowedly popular book, as it is well nigh impossible to place any reliance upon the English ones in the world of insect life. Thus this plain yellowish-brown species, with the dark body, ill-deserves the unpronounceable Latin name with which it has been endowed. It is a common enough species, and may be seen about in June and July. It may be observed resting on gates, palings, and similar places during the day. The larva feeds upon grass-stems from October to the following May, and is brownish-grey in colour, with a tinge of either greenish or ochreous. It is dotted with black, and the head, and some other parts, are of the same colour.

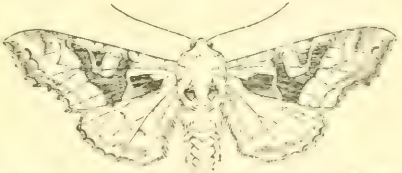


Dark Arches. Fig 25

Dark Arches.—(*Xylophasia monoglypha.*) This insect

(Fig. 25) is a much handsomer species, but it is subject to a good deal of variation from light reddish-grey to brownish-black, with much lighter hindwings in all the varieties. June to August is the flight-season, and it is a prolific species. It may also occur later in the year. The larva feeds on grass-stems, and is greyish in colour, with a tendency towards brownish or reddish, dotted, as a rule, with blackish.

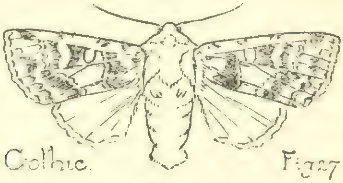
Angle Shades.—(*Phlogophora meticulosa.*) This species (Fig. 26) is not only widely distributed, but may be observed almost the whole year round. The food plants, too, are almost endless, as the larva will eat any green leaf that comes its way. It is brown, or green, in colour, with very small white dots. There is a pale line down the back, and on either side of this a mark resembling the letter V, and another pale line runs along the dusky spiracles. In spite of its common occurrence and frequent appearance, the Angle Shades is an attractive moth in the perfect state, being a prettily-designed mixture of light reddish-brown, and olive-green on the forewings, with whitish hindwings. Set specimens do not convey a good idea of the colour-effect of the living creature as the beauty disappears after death. When



Angle Shades Fig 26

resting it crumples up its forewings, and is thus more difficult to detect.

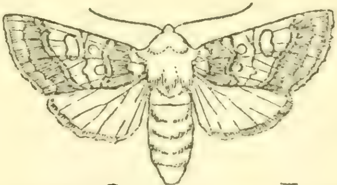
The Gothic.—(*Nænia typica.*) Common all over the countryside, and in gardens, this pretty little moth (Fig. 27), a succeeding relative of the Old Lady, is not at all particular as to haunt, or food-supply. The larva may be sought for from early Autumn to the following early Summer, and the imago is on the wing in June and July. The larva may be either brownish, or greenish-grey, with freckles of a darker tint. On the first body segment there are three pale lines, with pale streaks on the sides and dark markings on segments ten and eleven. The imago is reddish-brown on the forewings, with a pretty criss-cross design picked out with yellowish, and greyish-buff on the hindwings. The body is somewhat bulky for the size of the moth.



Gothic. Fig 27

Rosy Rustic. — (*Hydræcia* (*Gortyna*) *micacea.*) Another very common species, but more frequently met with near the coast than elsewhere. The dull-coloured larva is greyish-pink in colour, with an almost indistinct stripe down the back, dark brown dots, and black spiracles. It feeds from May to August on the stems of docks and plantains. In gardens and fields it will attack potato tubers. The imago is reddish-brown on the forewings, with yellowish hindwings.

Frosted Orange.—(*Ochria ochracea.*) The larva of this moth (Fig. 28) must be sought for where thistles abound. It is an internal feeder, and the prickly plants must be split right down the stem to enable the tenant to be found. Patience is necessary, as a good many plants may be examined without success. April to July is the time to search, and, if thistles prove blank, burdock and hemp agrimony can be tried. The larva is yellowish, prominently dotted with black. The dark pupa is also to be discovered in the stem of a plant, and as a rule, it is fairly low down. The imago is on the wing from early to late Autumn. It is greyish-orange on the forewings, with darker bands on the margins, and whitish on the hind ones.

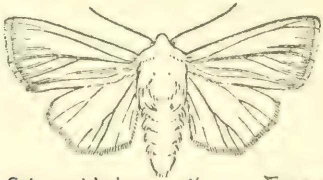


Frosted Orange. Fig28

Common Wainscot.—(*Leucania pallens.*) We are still among the internal burrowers, or feeders, as the extensive family of Wainscots—or many of them—are found in the larval and pupal condition in the stems of grass, reeds and other plants. The present species is of wide distribution and common occurrence, and the larva feeds upon various grasses from August to the succeeding May. It is of pale colour, and has three light-coloured lines down the back, as well as greyish stripes on the sides. It is freckled with pinkish-brown, and dotted with black. The perfect moth is fawn-colour on the forewings, and whitish, or greyish, on the hind ones.

Smoky Wainscot.—(*Leucania impura.*) Another common species of the same genus, feeding upon the same plants, and during the same period as *L. pallens.* It flies in July and August. The greyish-yellow larva has a brown stripe down the back, and one on the sides, dotted with black. The spiracles are reddish, with edges of black. In general colour this species closely resembles the last mentioned, except that the hindwings are greyish.

Striped Wainscot. — (*Leucania impudens.*) This species (Fig. 29) is of larger size than its two relatives just described, and more or less self-coloured in the imago, being fawny-brown, with a pinkish, or reddish, tinge. It haunts damp situations, as the larva feeds upon reeds, and the imago is on the wing in July and August. It should be sought for from June onwards in reed-beds by lakes, ponds, riversides, and similar places. The



Striped Wainscot Fig 29.

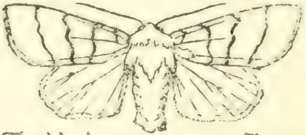
larva is brownish-ochre in colour, with three light lines down the back, and dark stripes on the sides.

Shoulder-Striped Wainscot.—(*Leucania* (*Cirphis*) *comma*). June and July sees this brownish, conspicuous-veined moth on the wing. It has acquired its popular name because of a black streak, succeeding a white stripe, on the forewings. It haunts grassy waysides, fields, and meadows. It is of wide distribution, and the larva feeds on various kinds of grasses from June until early Autumn. The larva resembles that of the Smoky Wainscot, but a dark line down the back is a distinguishing feature.

The Clay—(*Leucania* (*Sideridis*) *lithargyria.*) It seems strange that it is necessary for a moth having a short popular name to have bestowed upon it a scientific one of such dimensions. However that may be, The Clay is a common enough species where there are grasses in and near woods, and it is on the wing from June to August. The pale brown larva has a white line down the back, with dark edges, and a wide one on the sides of black, with a white edge beneath. There is also a whitish line under the blackish spiracles. It feeds on grasses in April and May. The imago is fawn-colour on the forewings, with a spot of white and some black dots, and greyish on the hind ones.

Brown-Line Bright-Eye.—(*Leucania* (*Chabuata*) *conigera.*) This species is familiar in many localities, but it appears more fond of the south than the north. It haunts grassy places, and is on the wing in June and July. The larva feeds on grasses in April and May, and is yellowish, or greyish-brown, with three lines of yellow down the back, another of the same on the sides, and a blackish one under the spiracles. The imago is yellowish brown, with three dark cross lines, and a white spot on the forewings, lighter on the hind ones.

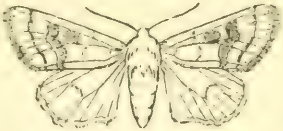
Treble Lines.—(*Grammesia trigrammica.*) This pretty little species (Fig. 30) has three cross lines on its light-coloured forewings, the latter being whitish, or greyish, as a rule. It is on the wing in June and July. The larva is partial to plantain and other dwarf plants, and the greyish, or brownish, colour is relieved with three light lines down the back, and another of ochreous-brown along the spiracles.



Treble Lines Fig 30

Hebrew Character.—(*Tæniocampa gothica.*) When the sallow (or palm) is in blossom in early Spring, this small moth is one of those specially attracted to the floral feast under the cover of darkness. The larva, however, prefers humbler fare, and feeds upon dandelion and dock, and the leaves of woody plants. It may be sought for from April onwards, the whitish eggs being laid in a cluster. The larva assumes different colours as it progresses, but when mature it is yellowish-green, with a triple set of lines down the back, and one along the sides. The imago has greyish-purple forewings, with curious dark markings, the latter accounting for the equally curious name. The hindwings are greyish-buff.

Common Quaker.—(*Tæniocampa stabilis.*) Of general distribution, this further member of the same genus (Fig. 31), is on the wing in March and April. The larva is fond of a variety of food-plants, readily taking the leaves of beech, birch, elm, oak, and sallow. It is green in colour, with small dots of yellow. There are three yellow lines down the back, and another of the same on the sides. The latter has a black margin on the upper part.



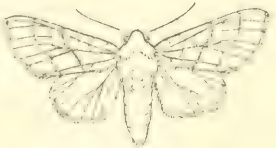
Common Quaker Fig 31

The forewings of the imago vary from pale to dark brown, with lighter markings towards the outer margins, and two roundish patches.

Clouded Drab.—(*Tæniocampa incerta.*) Belonging to the same genus, the Clouded Drab is subject to considerable variation, the forewings ranging from light greyish-brown to dark brown, and they may, or may not be ornamented. It is a lover of sallow blossom, and one of the chief guests that foregather there in early Spring. The food-plants resemble some of those of its last-mentioned cousin, and the green larva has small whitish freckles. There are triple white lines down the back, and another on the sides having a black upper margin.

Powdered Quaker.—(*Tæniocampa gracilis.*) This, the last member of the genus with which we are concerned, is as variable in colour as the aforementioned species, ranging from pale greyish-fawn to dark brown. The forewings have black dots. It flies in April and May, and will visit gardens, being attracted by the fruit blossom. It is a plentiful species, and well distributed. The larva should mostly be sought for in marshy situations, as it feeds upon water-loving plants, such as fleabane, meadow-sweet, and purple and yellow loose strife. It will also eat the leaves of bramble and sallow. Its green body is relieved with whitish spots, and has three light lines down the back and one on the sides, the last-named thrown up by an upper margin of darker colour.

Orange Sallow. — (*Cirrhia* (*Xanthia*) *citrago*.) Although popularly named Sallow Moth, this species (Fig. 32) frequents lime trees, where the larva may be sought for during April and May. It feeds upon the leaves, and is dark olive-grey on the upper part, dotted with white, but the lower part is indistinct greenish. There are three whitish lines down the back, and these have black edges above. There is a black mark on the segment adjoining the head. The imago is on the wing in August and September. The reddish-yellow forewings bear two dark wavy lines on each, whilst the hindwings are self-coloured, and much paler.



Orange Sallow Fig 32

Pink-Barred Sallow.—(*Xanthia lutea* (*flavago*)). This is a common species, and appears on the wing later than the last-named, September and October. The larva shows a liking for sallow catkins in Spring, but after these have disappeared it takes to dwarf plants, and will not disdain other things that come its way. Except that the forewings are well marked with dark spots and freckles, and in size, its general colour closely resembles that of *Citrago*.

Sallow.—(*Xanthia fulvago.*) Another common member of the same genus, the Sallow Moth resembles the last-named in appearance upon the wing, and the nature of its food plants. The larva is brown, with a purple or red tinge, with darker markings. The three light lines down the back are not by any means conspicuous, and there are two further stripes on the sides. The imago is very similar in colour and markings to the Pink-Barred Sallow, but is a trifle larger in size.

Dusky-Lemon Sallow.—(*Mellinia* (*Xanthia*) *gilvago.*) This is a darker-coloured species on the forewings than any of its relatives, but is still pale on the hindwings, hence the dusky prefix to its popular name. When the wych-elm is in seed is the best time to beat, or search, for the larva, as it feeds upon these. It is greyish-brown, tinged with pink, and has three lighter lines down the back, and a number of diamond-shape markings, purplish in colour. There is an ochreous-grey stripe low down on the sides, and above the black spiracles there is a purplish-brown mottling.

Chestnut.—(*Orrhodia* (*Conistra*) *vaccinii.*) This well-named species is found in Autumn and Spring wherever there are suitable woods. The larva is partial to the leaves of elm, oak, and other plants. Reddish-brown on the upper parts, and greenish below, it has light brown freckles along the back, and three pale lines. The body has whitish raised dots. The typical form of the imago is reddish-chestnut on the forewings, with a black spot on each, and greyish on the hind ones.

Early Grey. — (*Xylocampa areola.*) This prettily-marked moth is of wide distribution, and may be met with in March and April. When in repose by day, it is frequently observed, but at times it is difficult to see owing to its protection of form and colour. The larva should be sought for where there is honeysuckle as it feeds, under cover of darkness, upon the leaves of this favourite plant. The perfect insect is on the wing in early Spring, and has pretty light and dark grey fore-wings, and yellower hind ones.

Mullein.—(*Cucullia verbasci.*) This is one of the "Sharks," and when the larva is found in Summer on the mullein plant, or figwort, it is likely to be in some numbers. It is greenish or whitish, with yellow bands, some black spots along the back, and dots and lines of the same on the sides. The yellowish head has also black dots. The imago is yellowish-brown, with darker markings on the forewings, there is a dark patch on the head and thorax, and the hindwings are yellowish with darker striations.

Shark.—(*Cucullia umbratica.*) Belongs to the same genus as the Mullein Moth last described, but is of wider distribution. It is commoner in the Southern Counties than elsewhere. June and July see the moth on the wing, but it rests by day and is not often detected. It visits night-flowering plants, and may there be taken. Curiously enough, the larva is not nearly so "sweet-toothed," as it feeds chiefly upon the leaves of sow thistle. It may also be found consuming lettuce in the garden, hiding by day on the undersides of the leaves. It is greyish in colour, with blackish markings above, and a black head. The general colour of the imago is greyish, with darker transverse markings, and pointed extremities to the forewings.

FAMILY GONOPTERINÆ

Herald.—(*Scoliopteryx libatrix.*) This is the only British representative of its family, and although rare in Scotland, it is a familiar enough moth in England, Ireland, and Wales. It is on the wing from early Autumn onwards, and comes out again in Spring after hibernation. The narrow-bodied larva is more or less plain greenish, and may be found feeding upon various kinds of willow. It is abroad during Summer, and early Autumn. The greyish-brown, or purplish, forewings have a tinge of reddish, with a double white line towards the outer margins, and these are deeply cut. The hindwings are yellowish-brown.

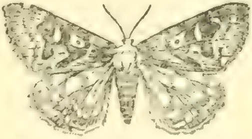
FAMILY QUADRIFINÆ

Burnished Brass.—(*Plusia chrysitis.*) First cousin of the more unfamiliar Golden Plusia, the Burnished Brass Moth is on the wing from June to August, haunting hedgerows and other places where there is a profusion of herbage. Stinging nettles appear to be the favourite food-plant of the larva, but it does not disdain other fare. It is pale green, and has a darker line of the same down the back, with an incomplete white border on either side. On segments four to eleven there is a streak of white, and one of the same on the lower part of the sides. The yellowish-brown wings of the imago have a metallic lustre, hence its popular name.

Plain Golden-Y. — (*Plusia iota.*) Why this species should be christened "Plain," and its cousin, *P. pulchrina*, "Beautiful" is difficult to ascertain, as *P. iota* is quite as good-looking as its more favoured relative. It is a common species, and appears on the wing in June and July. The yellowish-green larva has white dots, with a dark line down the back having a white margin. On the sides there is an incomplete whitish band of lines, and also a narrow line of yellow in the region of the spiracles. The favourite food-plants appear to consist of various members of the dead-nettle tribe, but it will also take hawthorn and honeysuckle. It hibernates during Winter, and feeds up in the Spring. The mark on the forewings of the imago is more like a V than a Y, except in certain specimens. The reddish-brown forewings are ornamented with yellow and dark brown, but the hindwings are yellowish-grey.

Silver-Y.—(*Plusia gamma.*) This silver-lettered cousin of the last-named is equally well-distributed, and occurs in Spring and Autumn. The larva is not at all particular as to its food-plant, and will partake of almost any kind of dwarf-herbage. It is found in various shades of green, from light to very dark, and on the body of the former variety a series of transverse whitish lines appear. The line along the spiracles is yellowish, and a dark green one runs down the back. The forewings of the imago vary from greyish-white to very dark colour, and the almost black pupa is hidden in a pale cocoon suspended under leaves of growing plants.

Mother Shipton. — (*Euclidia mi.*) This curiously-named moth (Fig. 33) is of wide distribution, and its brown and yellow wings are adorned on the front pair with marks that account for its popular, as well as scientific name of *mi*, the English name being accorded because of a fancied resemblance to the head of Mother Shipton, and *mi* because of the likeness of the marks to the letter M. It is fond of places where wild flowers



Mother Shipton. Fig 33.

flourish, the larva feeding upon clover, grass, and similar plants from July to September. It is light ochreous-brown, with lines of a darker tint down the back and sides. The pupa is hidden in a brownish cocoon, and this is, as a rule, attached to a grass-blade.

Red Underwing.—(*Catocala nupta.*) A specimen of this large moth at rest, with its lichen-coloured fore-wings closed over its handsome black and scarlet hind ones, is far different to the spread-out form of all four wings. It is sure to arrest attention by reason of the striking appearance of the hindwings, but is likely to be passed by otherwise. Search must be made for it adjacent to poplars and willows in the Eastern and Southern Counties during August and September. The deep purple eggs, having a yellowish apex and whitish bloom, are laid on the bark of the trees mentioned. The larva is whitish-grey, with dark brown markings, and is a night-feeder. The brownish pupa is profusely covered with a light-coloured powder, and is contained in a strongly-made cocoon, suspended among leaves.

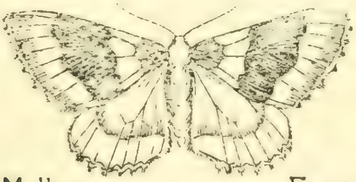
GROUP GEOMETRÆ

FAMILY GEOMETRIDÆ

Blood-Vein.—(*Trinandra amata.*) This is the only representative we can include of a large and interesting family of moths whose larvæ have, as a rule, only two pro or false legs, and in consequence progress by arching the body, and then drawing the hinder part along. The larva seems to be carefully surveying, or measuring, the area it wishes to negotiate. The present species is of wide distribution, but is rare in Ireland and Scotland. Damp situations where there is a profusion of rank herbage are frequented, and the chief food-plant seems to be dock. The brownish-grey larva has three light lines down the back. The perfect insect has pointed edges to the pale, fawn-coloured wings (especially those behind), with a blood-vein running across both pairs, succeeded by a narrower one towards the outer edge, and joining the former near the top corner of the fore-wings.

FAMILY HYDRIOMENIDÆ

Mallow.—(*Ortholitha cervinata.*) This species (Fig. 34) makes a late appearance in September and October,



Mallow. Fig 34.

sometimes later, and should be sought for where the mallow plant abounds. It appears to be commonest in the Southern Counties. The tapering larva is of a greenish tint, with yellowish between the segments. There are indistinct lines on the back and sides, the dots are whitish, and spiracles black. The eggs hatch in early Spring, and the larva feeds on the leaves of the mallow. The imago somewhat resembles a larger edition of the Shaded Broad-Bar, its smaller cousin next claiming attention, but the hindwings of the Mallow Moth are more greyish.

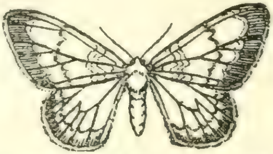
Shaded Broad-Bar.—(*Ortholitha limitata.*) July and August sees this moth on the wing, and it affects grassy and flowery situations. The greyish larva is dotted with black, and tinged with pink. It has also a treble line down the back, and a raised surface on the lower part of the sides. The food-plants consist of clover, grass, vetch, and similar constituents. The larva hibernates during Winter, and becomes full-fed the succeeding June. The yellowish-brown wings of the imago have a dark shaded pattern on the front pair, hence the popular name.

Winter Moth.—(*Chæimatobia brumata.*) One is sometimes surprised to notice a moth upon the wing in the depth of Winter, the precocious insect flying energetically around a street-lamp. In all probability it turns out to be this species, which is on the wing all through the dark nights. It is very common almost everywhere in our country, and is one of the most destructive pests of the garden. The grease bands placed around fruit-trees are to guard against, or prevent, the wingless female of this species from crawling up the trunk so as to deposit her eggs among the higher branches. The bands certainly do fulfil their purpose, but very often the moth still succeeds in passing the temporary barrier. The green larva is a great nuisance in gardens and orchards, if allowed to remain, devouring the leaves of fruit trees in Spring and early Summer. It has a darker stripe down the back, with a double white line on either side of this, and a yellowish one along the black spiracles. It is a plain yellowish-brown moth, and as has been stated, the female has only rudimentary wings, and is incapable of flight.

The Tissue.—(*Triphosa dubitata.*) Except in the North of England and Scotland this species is of common occurrence. It hibernates in the adult state, as in Autumn it visits various kinds of late-blooming flowers, and in Spring may be taken at sallow blossom. The larva feeds on buckthorn, but will also take blackthorn and other leaves. It is yellowish-green, lined and striped with darker. The imago is yellowish-brown, with a rather pretty pattern on the forewings. The edges of both pairs are deckled, especially the hind ones. The long pair of hindlegs seems to be a distinctive feature.

Dark Umber.—(*Scotosia rhamnata.*). This is a familiar species in the South, and is abroad up to mid-Summer. The larva, as its specific name indicates, feeds upon buckthorn. It is green, with two yellow lines and one of dark green down the back, and there is a purple stripe below the spiracles. It spins two leaves together and hides between them. All the wings are more or less the same colour, being brownish, closely dotted and marked with darker, and having indented outer edges.

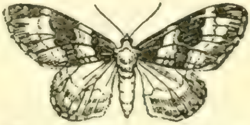
November Moth.—(*Oporabia* (*Epirrita*) *dilutata.*) Common almost over the whole country, this species (Fig. 35) is, as a rule, found not far from wooded regions. It is first on the wing about October, and is, therefore, somewhat misnamed. The larva may be discovered feeding from April onwards upon such plants as apple, birch, blackthorn, elm, hawthorn, oak, plum, and sallow. It is green above, and somewhat lighter on the lower part, with a middle area of purplish-red, made up of bands or spots. The forewings of the imago are marbled with greyish, and picked out with black veins. The hindwings are much lighter.



November Moth. Fig 35

Silver-Ground Carpet.—(*Xanthorhoē montanata.*) Occurring in woods, and lanes bordering same, this species is on the wing in June and July, and is well distributed. The larva has a raised surface on the sides, and a wrinkled appearance. It is light brown to purplish, dotted with blackish. There are treble lines down the back, and a pale line on the lower sides. It is a night-feeder, and the plants eaten are of a dwarf nature, such as bedstraw and grass. It may be sought for from August to April, and is a hibernating larva. The imago is silvery-grey on all four wings, with darker markings on the front pair.

Garden Carpet.—(*Xanthorhoë fluctuata.*) This well-distributed species (Fig. 36) is at least double-brooded, and may be discovered almost throughout the year. It haunts gardens, as its name implies, and the larva feeds on various plants in the flower, fruit, and vegetable garden. The larva may be almost any colour from dark grey to indistinct green, but is invariably lighter beneath. It is blotched down the back with pale colour, and is spotted with black on the central segments. The imago is greyish-brown, with dark markings on the forewings, and lighter self-colour on the hind ones.



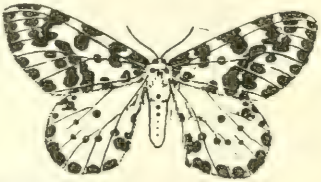
Garden Carpet. Fig 36.

Common Carpet.—(*Xanthorhoë (Epirrhoë) sociata.*) This pretty little moth is of common occurrence throughout our island, but is particularly plentiful in the Southern Counties. It flies in May and June, and, later, in August and September. The larva is fond of bedstraw, and should be sought for where that wild plant flourishes. In colour the larva varies, light fawn, brownish, and both bright and dark green, being represented in different specimens, and there are dots and freckles of white, one black and two white lines down the back, with a

V mark on some of the segments. The pupa is reddish-brown. The imago has greyish-brown fore and hind wings, attractively ornamented with pretty markings.

FAMILY BOARMIINÆ

Magpie.—(*Abraxas grossulariata.*) Missing the large array of Pug Moths, of which perhaps *Eupithecia vulgata* is the commonest species, brings us to the familiar Magpie Moth (Fig. 37) which belongs to the Family *Boarmiinæ*. The black and white form of the perfect insect is well known, but it is subject to considerable variation. As a rule it occurs in July and August, and is a common inhabitant of the garden, as well as the countryside. The larva feeds upon various garden and wild plants, and when it occurs in any numbers it is a serious pest. The larva is creamy-white, with blotches



Magpie Fig 37.

and dots of black down the back, and black dots along the sides. There is a wide line of reddish low down the body, and the head is black.

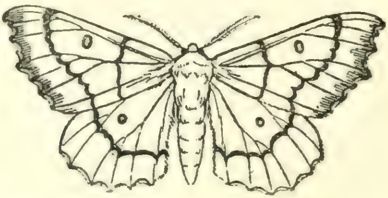
Early Thorn.—(*Selenia bilunaria.*) This light brown moth, with sharp pointed forewings and the margins of both pairs somewhat indented, is well distributed, and appears in Spring. It is double-brooded, the first larvæ feeding in May and June, and the second batch in August and September. The orange, or reddish-brown, larva has a raised surface on segments seven and eight, and when at rest on a twig, is very difficult to detect. It feeds upon alder, birch, blackthorn, hawthorn, sallow, and other woody plants. When resting, this species assumes the position of a butterfly rather than a moth.

Lunar Thorn. — (*Selenia lunaria.*) Although of wide distribution, this pretty species, having very deeply-cut margins to the brownish-yellow wings and a moon-like marking on each of the four wings, is nowhere plentiful. In its general habits it closely resembles *S. bilunaria*, but the larva occurs later, from July onwards. It is brownish, with lighter or darker markings, with indistinct lines down the back. It is, however, found to exhibit a good deal of variety.

Purple Thorn. — (*Selenia tetralunaria.*) This larger and darker-coloured species has the four whitish moon-marks of the last-named, but the wing-margins are not so deeply cut. The inner patch of dark colour is, however, more pronounced. Its chief stronghold is in the South, but it is local. It flies in April and May, and the second brood in July and August. The reddish-brown larva has darker brown mottlings, as well as light greyish. The food-plants consist of alder, birch, cherry, oak, sallow, and the like.

Lilac Beauty.—(*Hygrochroa* (*Pericallia*) *syringaria.*) To confer upon a moth possessing such a pretty name a scientific one of such dimensions seems altogether unfair and unreasonable. As such, however, it is known, and it is not for us to suggest an alternative. Of general distribution, the Lilac Beauty Moth is, it must be confessed, more fond of the South. It flies in June and July, and in addition to the so-called lilac (syringa), the larva feeds upon honeysuckle and privet leaves. The yellowish-brown larva is relieved with reddish and violet, and its peculiar form, with a two-pronged horn behind the head, and two pointed sections further along the back, is very noticeable. The pupa also is of a curious description. The imago is yellowish-brown with reddish cross lines, and the male is the smaller of the sexes.

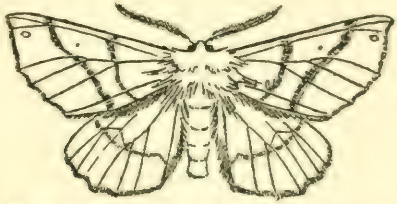
Scalloped Hazel.—(*Gonodontis bidentata.*) Although a melanic form of this moth (Fig. 38) occurs in the North of England, the more usual colour is from light fawn to



Scalloped Hazel Fig33

dark brown, with cross-lines over both pairs of wings, and a spot on all four. It is on the wing during early Summer, and the larva should be sought for where there are such trees or bushes as birch, blackthorn, hawthorn, larch, oak, sallow, etc. It is purplish in ground colour, mottled with brown and yellowish, and the pupa is reddish-brown. The egg changes colour to the latter from its initial one of bright blue.

Feathered Thorn.—(*Himera* (*Colotois*) *pennaria.*) This species (Fig. 39) is more or less restricted to the neighbourhood of woods, and whilst fairly well distributed it shows a partiality for the Southern Counties. It makes a late appearance in October and November, and may be observed flying round street lamps. It deposits a batch of eggs upon a twig, and these are not easy to detect. The larva is to be found from April onwards, and is slaty-grey in colour, with an inclination towards purplish. Along the back there occurs a number of indistinct diamond-shape marks, and a set of dots on either side, both being ochreous in colour. There are raised points on the last segment, and these have reddish tips. The

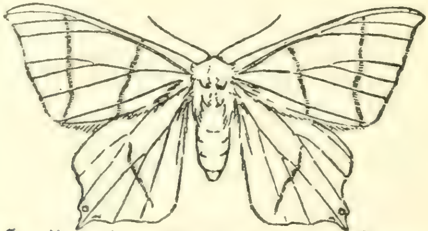


Feathered Thorn Fig 39

food-plants consist of apple, birch, blackthorn, hawthorn, oak, poplar, sallow, and other plants. The fawn-coloured imago is frequently tinged with reddish, and it has cross lines, and a spot on all four wings, with feathered antennæ.

Scalloped Oak. — (*Crocallis elinguaria.*) Of common occurrence in most parts of the country, this moth is, as a rule, on the wing in July and August. The larva will take almost any kind of green leaves, and shows considerable variation, from ochreous-grey to darker colour, with a purple splash. There are diamond-shape marks along the back, and the raised protuberance on the last segment has a black margin. The lemon-yellow wings of the imago have a patch of light brown on the fore pair, with indistinct freckles around all the edges, and a spot on each.

Swallow-Tail. — (*Ourapteryx sambucaria.*) This light yellow moth, with pointed fore and hind wings (Fig. 40), is sure to arrest attention during July in the region of gardens, lanes, and woods, but it is rare in Scotland. The brownish larva has purplish or reddish variegations,

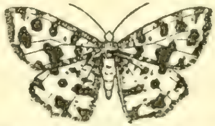


Swallow-tailed Moth Fig 40

and feeds upon alder, blackthorn, hawthorn, and ivy. It hibernates during Winter.

Brimstone.—(*Opisthograptis luteolata.*) The bright sulphur-yellow wings of this smaller species are relieved with patches of brown on the fore pair. It is mostly on the wing during May and June. The brownish larva closely resembles a twig, and it has a tinge of greenish or purple, with a forked hump on the sixth segment, and further raised portions on segment eight. Blackthorn, hawthorn, and plum appear to be the favourite food-plants. The larva hibernates in Winter, and a second generation appears during Summer.

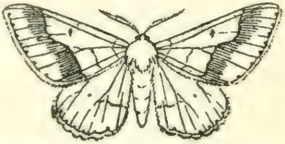
Speckled Yellow. — (*Venilia maculata.*) This very common, but nevertheless pretty yellow and brown-freckled species (Fig. 41), is a frequenter of woods, and is on the wing in May and June. It is more often met with in the South and West of England, though it does occur elsewhere. The green larva is lined and striped with white, and feeds in July and August upon woodland plants, such as wood sage, woundwort, etc.


Speckled Yellow. Fig41

Early Moth.—(*Hybernia rupicapraria.*) So-called because of its early appearance during the first few weeks of a New Year, this species is quite common, although rarely seen. It appears to frequent hedgerows for the most part, and may there be discovered. The greenish larva has a white stripe down the back, and white markings along the sides. It may be lighter, or darker, in body colour as the case may be. It feeds upon bilberry, blackthorn, hawthorn, and plum. The male imago is light sooty-brown, with paler hindwings, but the female is wingless.

Spring Usher. — (*Hybernia leucophæaria.*) Although of local occurrence, this early Spring rover is fairly widely distributed. The neighbourhood of oak trees is frequented, the food-plant consisting of the leaves in question. The green larva has yellowish lines down the back, and there may also be brown ones along the sides, or dark marks upon each segment. The female imago is very small and wingless. The male has greyish to brownish forewings, and lighter hind ones, and several varieties exist.

Dotted Border.—(*Hybernia marginaria.*) This plain-looking moth (Fig. 42) is quite a common species almost everywhere, and appears in March and April. It resorts to hedgerows, but the wingless female is not often espied. The larva feeds upon alder, birch, blackthorn, hawthorn, oak, and sallow, and may be greenish-brown, olive-green, or dull yellow. It has several dark grey X-shape marks

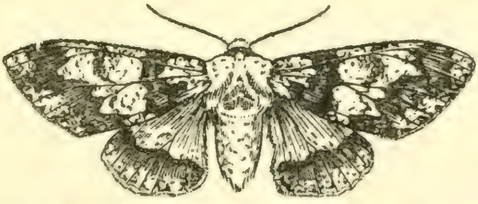


Dotted-border umber Fig 42

down the back, with white spiracles. There are other effects, including a lighter colour below. The male imago has self-coloured reddish-brown forewings, and whitish hindwings.

Mottled Umber.—(*Hybernia defoliaria.*) Still belonging to the same genus, the Mottled Umber Moth shows considerable variation in the perfect male, ranging from light fawn to brownish-red, and the forewings may, or may not be ornamented with markings. The wingless female has a thin tapering body of a dark colour. It is a common species, and the larva feeds upon birch, honeysuckle, oak, rose, and other trees. Oak trees in particular are stripped of leaves by these ravenous larvæ, and often experience difficulty in recovering from the shock received. The larva is variously shaded with reddish-brown down the back, with yellowish sides and under parts. There is a black line over the spiracles, with an inconstant white margin.

Oak Beauty.—(*Pachys* (*Amphidasys*) *strataria.*) This pretty species (Fig. 43) is of frequent appearance, but is nowhere abundant. It sometimes occurs as early as February, and as late as May. It may be seen resting



Oak Beauty (female). Fig 43

during the day on fences, palings, and other places. The brown, greyish, purplish, or violet larva has mottlings and freckles of darker colour, and feeds upon birch, blackthorn, elm, oak, plum, etc. The forewings of the adult insect are greyish, with brown bands and other markings, whilst the hind wings are greyish. It has a thick dark body.

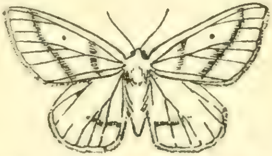
Peppered Moth.—(*Pachys betularia.*) The peppery appearance of both pairs of wings of this well-named species at once identify it, but there is an almost black variety as well. It is a familiar moth, and appears in May and June, or later. The larva is some shade of brown, or green, with small white dots on the latter form, and other markings. The head is deeply notched, and ochreous in colour, with a purple tint. The food-plants are made up of beech, birch, elm, oak, sallow, and the leaves of fruit trees. It should be looked for during July and the two succeeding months.

Square-Spot.—(*Tephrosia consonaria.*) This plain fawn or greyish moth is of somewhat local appearance, and favours the South of England, though it also occurs in Wales and Ireland. It loves woodland, and is on the wing during May and June. The larva is ochreous-brown, with a paler line down the back. There is more greenish on the under surface, and the body is more or less wrinkled. The food-plant is selected from beech, birch, oak, pine, or the leaves of some other forest tree.

Common Heath. — (*Ematurga atomaria.*) A typical heathland moth, and very abundant in its native wilds. It is on the wing in May and June, and the larva may be found feeding upon heather, or other moorland plants, during July and August, sometimes later. The larva may be some shade of brown, grey, ochreous, or purple. Some larvæ have white spots down the back; others have light diamond-shape marks. It is a pretty moth, varying in colour from greyish to dark brown, the lighter examples lending themselves to ornamentation. Both pairs of wings are similarly coloured and marked.

Bordered White.—(*Bupalus piniaria.*) This moth must be sought for in fir or pine woods during May and June, and is of fairly frequent occurrence. The greenish larva has an elongated body, lined with whitish or yellow. The food consists of fir and pine leaves, and the larval period is from August to October. The male imago may be either white or yellow in the paler markings of the wings, the rest of the colour being light or dark brown. The female is generally orange colour in southern specimens, but darker in those observed in the north.

Brown Silver-Line. — (*Lozogramma* (*Phasiane*) *petraria.*) This species (Fig. 44) must be sought for on bracken-covered heaths, hillsides, and woods in May and June. The olive-green larva has lines of reddish-brown, with a line of whitish beneath the black spiracles. It feeds upon bracken. The fawn-coloured forewings



Brown silver-line. Fig44

have cross lines, edged with whitish (hence the popular name), and the hindwings are silvery-white all over.

Latticed Heath.—(*Chiasmia* (*Strenia*) *clathrata.*) The Latticed Heath is mostly found in the Southern and Eastern Counties, but it occurs elsewhere more sparingly. It delights in chalky uplands and where clover flourishes, and it is interesting to notice that it is on the wing by day. It is double-brooded, the first appearing in April and May, and the succeeding one in July and August. The green larva is lined with white down the back and on the sides, and has a somewhat notched head. The food-plants consist of clover and trefoil. The lattice-work exhibited on both pairs of wings is very attractive, the colours being made up of yellow and brown, broken into a series of draught-board markings, with treble cross lines.

OTHER GROUPS

FAMILY ZYGÆNIDÆ

Five-Spot Burnet.—(*Zygæna trifolii.*) There are seven species of Burnet Moths found in Britain, and two of these—the Five-Spot and Six-Spot—occupy a place in this volume. The pretty little Forester Moths also belong to the same family, but whereas the Burnets are all more or less adorned in a dress of green and scarlet, the Foresters—as their very name should indicate—

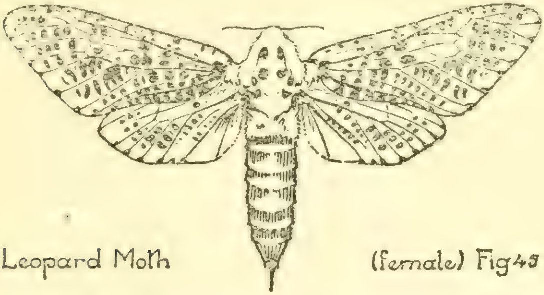
are coloured more like the greenwood fastness. These are social creatures as, where one is found, another is almost bound to follow. At least one British species of Burnet Moth has transparent wings (*Z. purpuralis*), although the rare Scotch or Mountain Burnet (*Z. exulans*) is almost equally entitled to be thus regarded. The Five-Spot, as its popular name indicates, has five spots of red on the greenish forewings, with red hindwings bordered with green. The moth has a dark body, and, prominent black antennæ. It rests in a very careless, devil-may-care way on grass-blades, and may be picked off without any attempt being made on its part to escape. It haunts grassy places where the soil is damp, with the proviso that the pretty wild trefoil (*Lotus corniculatus*), or some kind of clover, is at hand ready for the larva to feed upon. The larva is greenish in colour, marked with black on the back and sides. It feeds for several months, and, on occasions, actually attains its second year's birthday before the life-cycle is complete. The pupa is enclosed in a straw-coloured cocoon attached to grasses, and if, as sometimes happens, the observer strikes the right time for emergence, a very wonderful sight will be presented.

Six-Spot Burnet.—(*Zygæna filipendulæ.*) Except that it has six red spots on each of the forewings, this species (see Frontispiece) closely resembles its five-spot cousin, and is the commoner of the two. As with the last-named, a beautiful variety, having yellow instead of red exists, and in still another form the red spots on the forewings all run into one another, and thus make a complete pattern of themselves. That certain kinds of these Burnet Moths cross with each other seems proved, as most interesting hybrids are met with. The Six-Spot resorts to chalky localities, the sea-coast, and damp situations, as well as grassy meadows. When the latter are frequented the moth appears on the wing earlier in the Summer than its relatives which frequent other places.

FAMILY COSSIDÆ

Goat Moth.—(*Cossus cossus* (*ligniperda*).) This greyish brown moth, of which the female is the larger of the two sexes and has a pointed extremity, has acquired its popular name because the reddish larva (fat and sluggish when full-fed) gives off an odour which reminds one of the smell of the useful four-footed animal after which it has been christened. The larva has a prominent black head, and there is a mark of the same colour on the next succeeding segment of the body. It is also covered with a few scattered hairs. The larva eats its way into the heart of a tree, and willows in particular are often riddled with its burrowings. It feeds upon the wood as it proceeds, and when willow is not obtainable, it will burrow into and consume ash and elm. When ready to pupate, the fat larva often leaves its host-plant, and proceeds to a suitable place where it can safely form a cocoon in which to become encased. It takes three or four years before this happens, and as the larva requires food for a good part of the time, the amount it consumes (and the harm it perpetrates) can well be estimated. It has a fairly extensive distribution, and although the imago may not be seen, the conspicuous larva is most likely to attract attention, especially when soft decayed wood from a pollarded willow is pulled away so as to disclose the ramifications of the creature in question.

Wood Leopard.—(*Zeuzera pyrina.*) This (Fig. 45) is another internal feeder, as the larva finds its way into the heart of fruit and other trees, and must be regarded as a garden pest. As with the Goat Moth, the larva spends a considerable time in its second stage of existence before making preparation to pupate, and this adds to the mischief, as two years' feeding on the part of a hungry larva means the disappearance of "many cargoes." The dull whitish larva has a yellow tinge, with a good assortment of black spots, and blackish-brown on the first and last segments. The pupa is reddish-brown, and may be found inside the food-plant wrapt in a cocoon made of

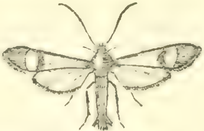


Leopard Moth (female) Fig 45

sawdust (the result of the larva's burrowings), and silk. The spotted wings of the imago (hence the fancied resemblance to the rosettes or spots upon the sleek coat of the Leopard), easily identify this species. The male is a good deal smaller than the female, and his body does not taper to a point. The antennæ of the male are not wholly thread-like (as in the female), only the extremities being thus formed.

FAMILY SESIIDÆ

Currant Clearwing.—(*Sesia tipuliformis.*) Those unacquainted with insects might very well be excused if



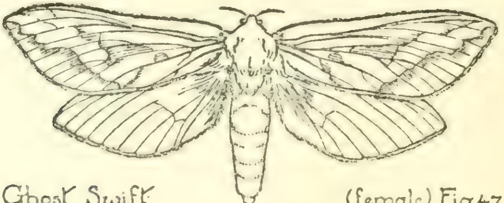
Currant Clearwing. Fig 46

surprise was expressed at the Clearwings being included among the moths, as they are so unlike the rank and file of lepidopterous insects. Although there are some fourteen British species—two in particular strikingly resemble the Hornet—it is only possible to include the Currant Clearwing (Fig. 46), so as to represent this interesting family here. The clear, transparent wings are a characteristic feature. The imago takes at least a couple of years to reach the perfect state, and the larvæ pass their time (and find their food) in the branches, roots, and stems of various kinds of woody and other plants. A most interesting point concerning these Clearwing Moths is that it appears certain they all emerge from the pupa *during the forenoon*, and that the influence of the sunshine has much to do with this magical transformation.

The Currant Clearwing, as its name indicates, is partial—when in the larval state—to currant bushes, the larva burrowing into the stem, and doing incalculable damage. Having selected a branch to attack, the larva works its way downwards consuming the pith as it proceeds, and until such time as it becomes quite full-fed, when it makes its way towards the outer edge of the branch, and then pupates. The reddish-brown pupa can be found just beneath the bark of the plant, so that all is ready for the final emergence when the great moment arrives. It is a small moth, the outer margins of the wings being bronze-coloured, caused by orange markings situate between the veins. There are bands of yellow on the dark body, and a tuft of black at the extremity forms a kind of tail. The long legs of these moths, as well as the curious open-work of the fore and hind-wings, are worthy of note.

FAMILY HEPIALIDÆ

Ghost Moth.—(*Hepialus humuli.*) This species (Fig. 47) has obtained its English name by reason of its silky-white form, all the wings of the male being thus coloured. Other varieties are found, but the male type is of the ghostly make-up. The female imago is very different from her mate, being yellowish on the fore-wings, and lighter brownish on the hind ones. She also exceeds the male in size. The pointed edges to all four wings, and their wide stretch, should also be mentioned. The Ghost Moth is a very familiar species in Britain, and the male is sure to arrest attention when seen. The larva becomes full-fed in May, the favourite plants being the roots of such wayside weeds as burdock, dandelion, and dead-nettle. It is thus of use in helping to keep down these obnoxious plant-pests. The imago is on the wing in June and July, and the white form of the



Ghost Swift (female) Fig 47.

male may often be seen suspended from various kinds of herbage. It seems less inclined for exercising its powers of flight than the females, who possess a well-sustained mode of progress, and have an unfailing habit of finding one of the waiting males.

Common Swift.—(*Hepialus lupulina.*) First cousin of the last-mentioned species, the Common Swift Moth (Fig. 48), is of frequent occurrence wherever there is a wealth of grassy ground, and may be seen pursuing its airy course towards evening, or, as more often happens, resting upon a paling, fence, or other environment. It is on the wing from June onwards. The larva is glossed with whitish, with a brown head, and raised brownish dots. Its body is fairly well covered with hairs. Grass-roots form its staple food, and it becomes full-fed about the same time that the voice of the wandering Cuckoo is heard again in our land. The yellowish to brownish wings of the imago are not of a very attractive nature unless, as obtains in the male form, the fore-wings are relieved with whitish markings.

Common Swift Fig 48

Here we take leave of these scale-winged insects, deeply sensible of the large number it has not been possible to include in this volume, but conscious of the fact that the life-story of any one species would be sufficient to engage, not merely the study of an hour, or a season, but the devotion of a lifetime. If what has been written leads to this very desirable end, our efforts to create interest and arouse enthusiasm will not have been in vain.

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